

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR • UNDERGROUND

DIESEL PROGRESS

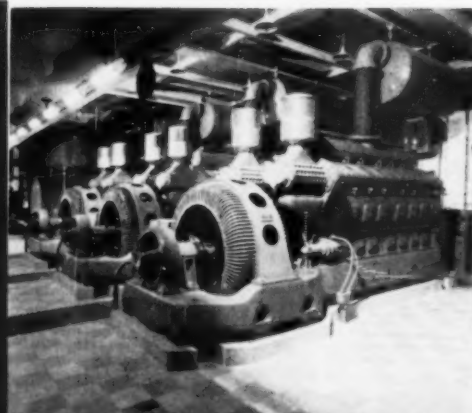


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JANUARY, 1949

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The Bull Calf tow, owned by Canal Barge Co., equipped with two Harbormaster Models O-7, each 300 H.P. diesel

HARBORMASTERS INCREASE SPEED 1.57 M.P.H.

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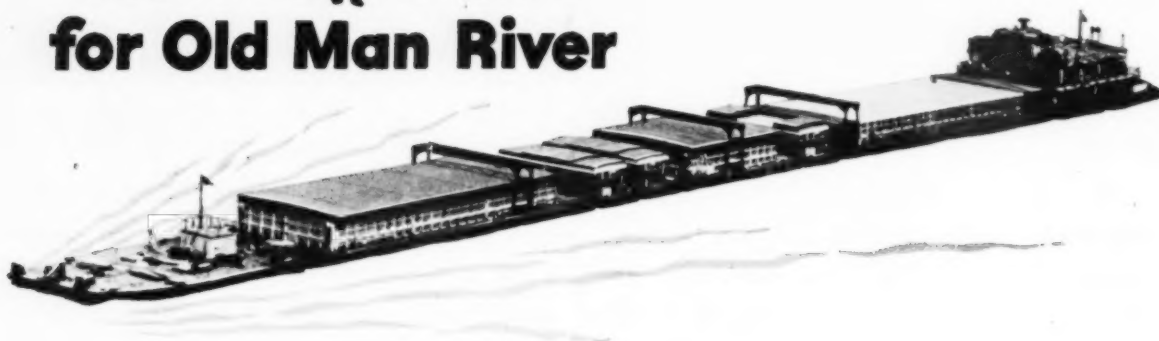
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This power section of the "Harry Truman" handles 9 integrated barges, built by the American Bridge Company and Ingalls Shipbuilding, with a total carrying capacity of approximately 12,000 tons. Coupled together, they form a streamlined vessel without breaks to reduce water friction or drag.

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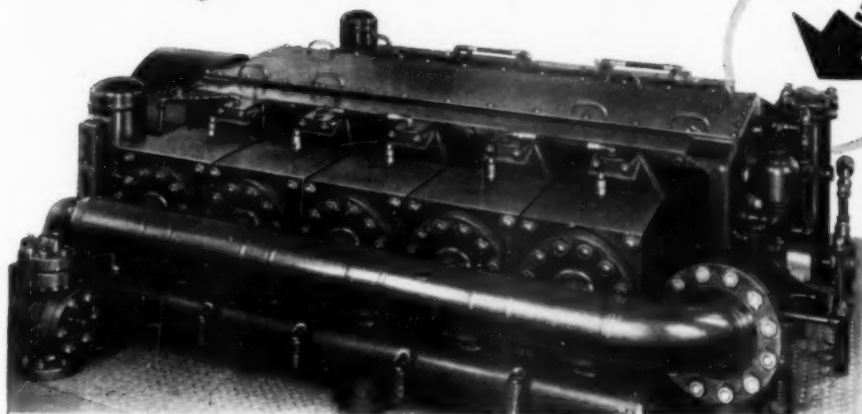
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150 TO 2000 H.P.



CLEVELAND DIESEL ENGINE DIVISION
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GENERAL MOTORS

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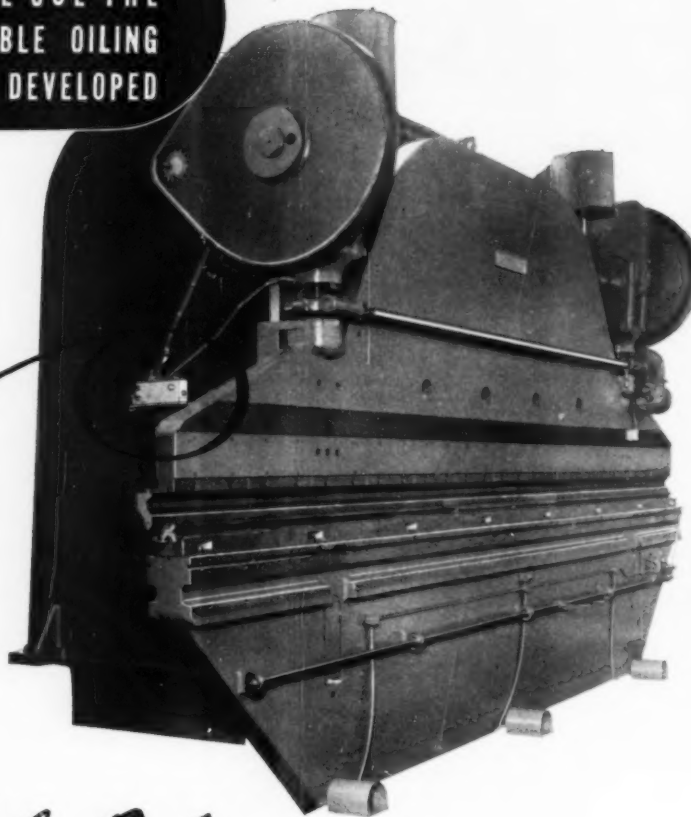
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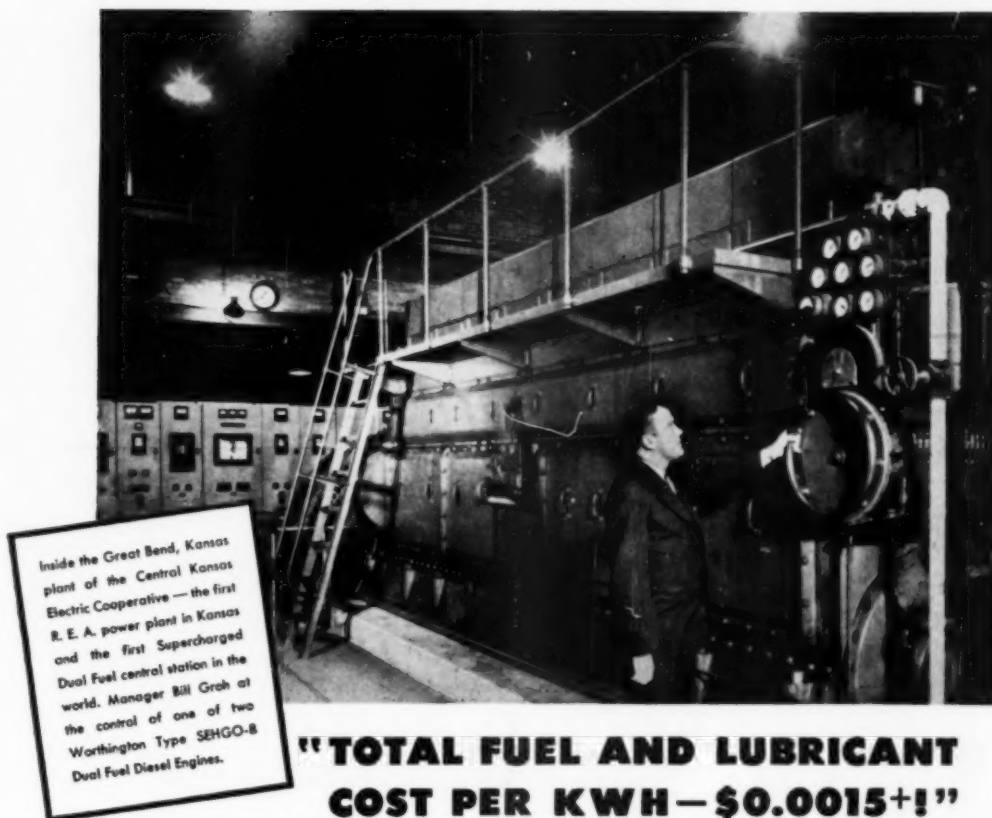
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Inside the Great Bend, Kansas plant of the Central Kansas Electric Cooperative — the first R. E. A. power plant in Kansas and the first Supercharged Dual Fuel central station in the world. Manager Bill Groh at the control of one of two Worthington Type SEHGO-8 Dual Fuel Diesel Engines.

"TOTAL FUEL AND LUBRICANT COST PER KWH — \$0.0015+!"

Kansas R. E. A. Station Reports Steady Savings With Worthington Supercharged Dual Fuel Diesels

One way to get the real low-down on economical generation of electric power is from a progressive R. E. A. plant. Here, in part, is what the Central Kansas Electric Cooperative Association has to say about its Worthington Dual Fuel Diesel equipment:

"Our engines have run approximately 3050 and 4100 hours, respectively, under loads varying from 300 to 1160 KW. Operation has been satisfactory at all loads.

"One remarkable point is the low lubricating oil consumption. . . . Also, we have had very little maintenance work.

"The past month the total fuel and lubricant cost per KWH generated has been 1.517 mills. . . . The saving of gas over fuel oil is very great.

"A fire necessitated shutting off our gas line for 12 hours. We switched to oil Diesel operation without any interruption."

Economy In Every Detail

With Worthington Dual Fuel Diesels you get outstanding thermal efficiency on the cheapest fuel available — oil, gas or oil-and-gas in any ratio — while Worthington's long leadership in developing Diesel design and performance means additional power for every operating-dollar you spend. For further proof that there's more worth in Worthington, contact Worthington Pump and Machinery Corporation, Engine Division, Buffalo, N. Y.

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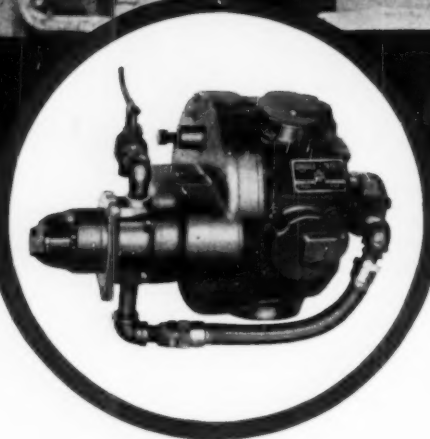
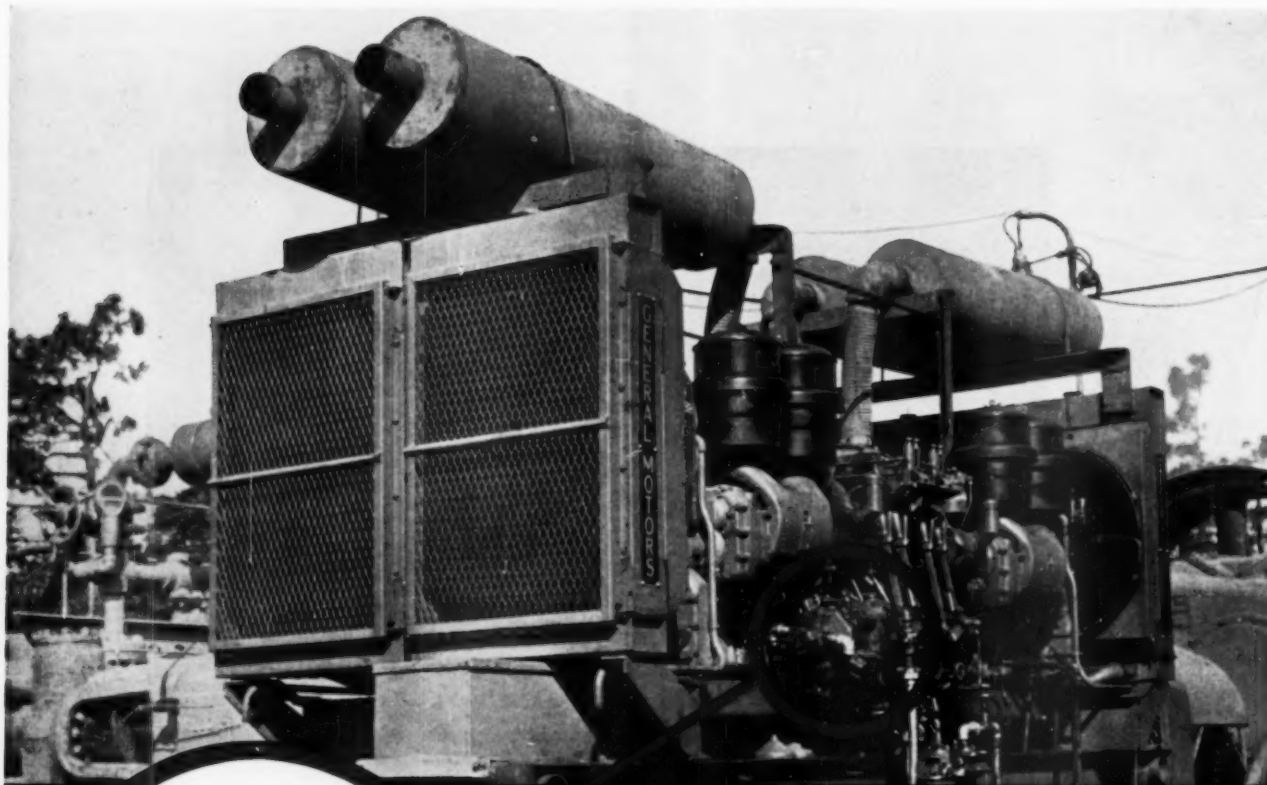


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Gardner-Denver MBGS
5-cylinder radial air motor

SURE STARTING COSTS LESS with Gardner-Denver Air Starters

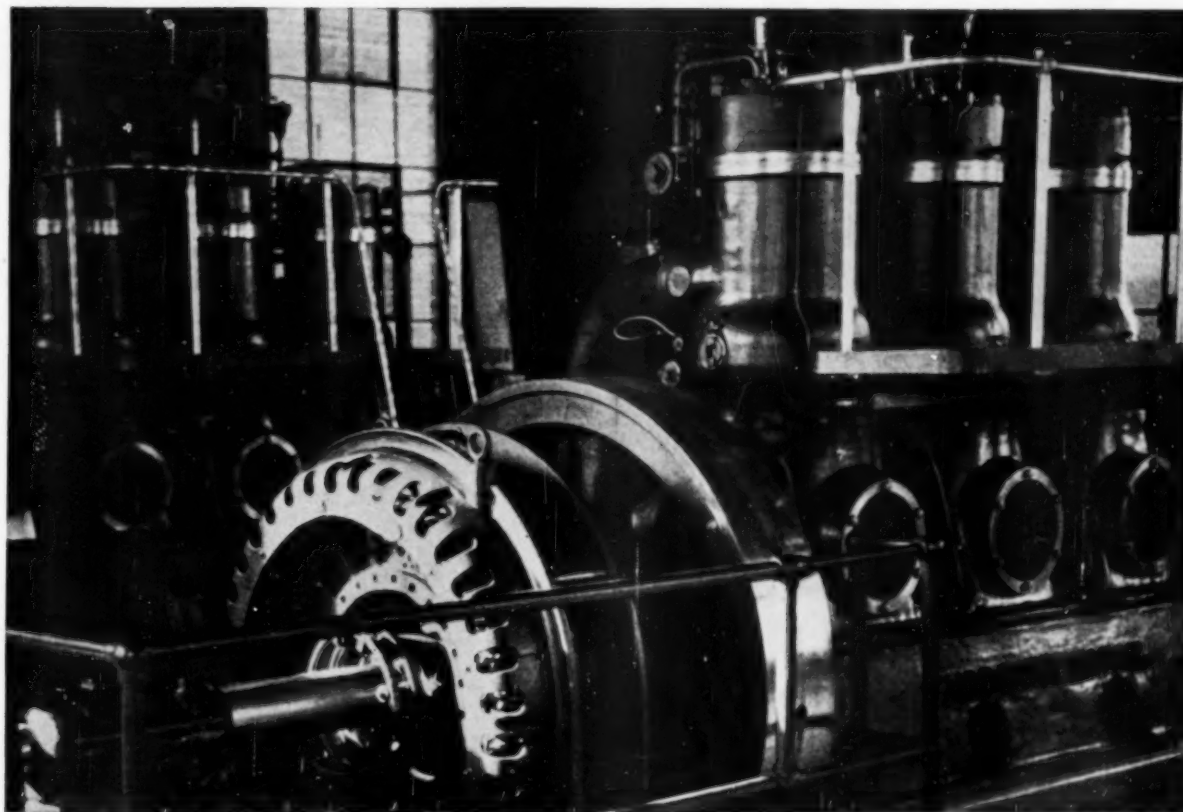
Sure, safe starting without costly battery maintenance and replacement! That's why Gardner-Denver Air Starters provide the *modern* way to start your Diesels. Here are the reasons why they give greater reliability and economy to Diesel performance:

1. **High torque for high loads.** The 5-cylinder radial design of Gardner-Denver Air Starters assures exceptionally high torque for a sure start. Gardner-Denver Air Starters are especially desirable for applications involving high starting loads.
2. **Positive, safe engagement.** When the air valve of a Gardner-Denver Air Starter is open, an air actuator starter pinion automatically engages the ring gears a split second before the starter begins to crank the engine. An exclusive Gardner-Denver feature.
3. **Wide range of sizes.** Gardner-Denver Air Starters are available in five sizes from 3 h.p. to 15 h.p. on 100 pounds of air pressure—with more power at higher pressures. Several gear ratios are available.

Write for complete information and dimension prints,
Gardner-Denver Company, Quincy, Illinois.



GARDNER-DENVER SINCE 1856



From maintenance troubles to top Diesel economy

**Nonpareil HD
Diesel Oil**

INCREASING frequency of shutdowns on the two FM Diesels shown above caused the operators of the Preston, Iowa, light and power plant to become concerned. Shutdowns were necessary every three to six months. Something had to be done to stop these interruptions to service.

Shutdowns were caused by excessive varnish and carbon. Top rings on the pistons were sticking. Cylinders showed increasing wear. A Standard Oil Lubrication Engineer suggested a logical step to stop these troubles: switch the engines from a conventional lubricant to a superior heavy-duty oil... Nonpareil HD Diesel Oil.

In four years' operation on Nonpareil HD, there have been no stuck rings, no varnish, and a minimum of carbon. Maximum wear on any one cylinder, in the last 9600 hours of operation, has not exceeded .001 of an inch. Lubricant consumption has been reduced approximately 40%.

These results have meant new Diesel economy for the Preston

light and power plant. The period between inspections has been extended to 12 months. Operating costs and time spent for overhauling have been reduced to new lows. A new 450-HP Fairbanks-Morse Diesel, installed in 1947 and lubricated with Nonpareil HD, is adding to the efficient production of this plant.

Why not take the logical step to increase reliability and economy of your Diesels by shifting to Nonpareil HD Diesel Oil? If your plant is located in the Midwest, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, to secure the services of the Standard Oil Lubrication Engineer nearest you.

STANDARD OIL COMPANY (INDIANA)



Sturdy

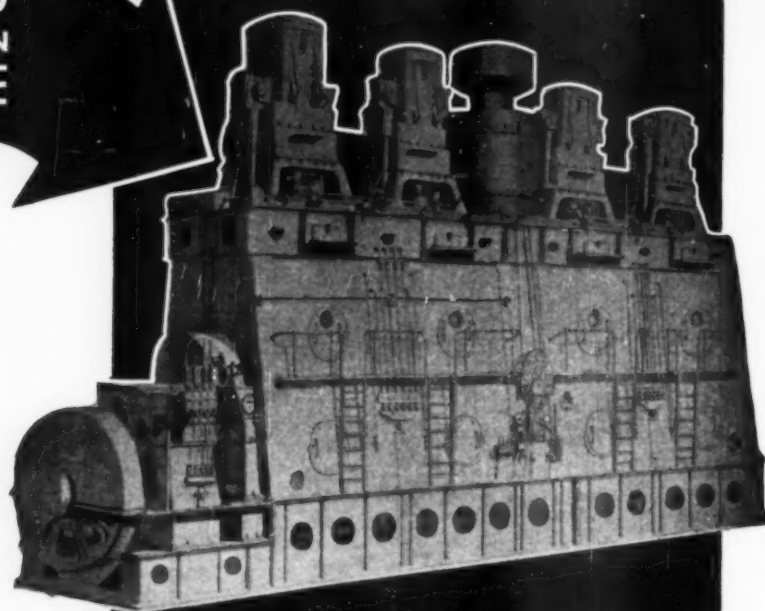
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from
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Harrison heat exchangers—oil coolers and water coolers—help to maintain this harmony by holding lube oil and jacket water temperatures within proper limits.

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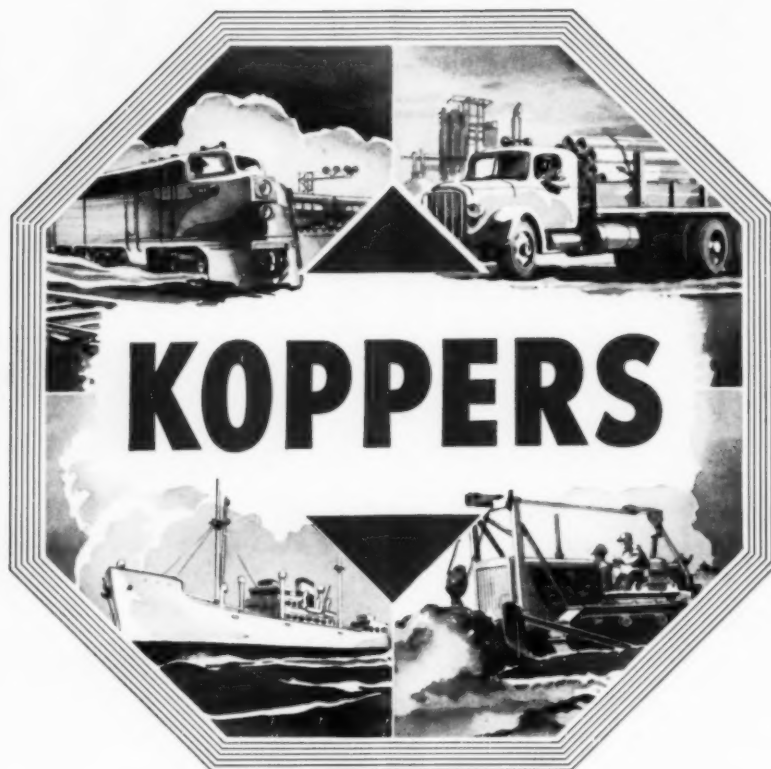
Marine engine manufacturers are invited to consult Harrison engineers and to make use of Harrison technical facilities.



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JACKET WATER COOLERS

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That's why more and more are specifying Koppers American Hammered Piston Rings which embody the greatest engineering advances in the history of compression engineering — Porous Chrome* and K-Spun, the miracle metal for piston rings.

If you have a problem of design or maintenance, it will pay you to consult our engineering department. Their experience and ability in giving more progress to power is at your service. Koppers Company, Inc., Piston Ring Department, Box 626, Baltimore 3, Maryland.

*VAN DER HORST PROCESS

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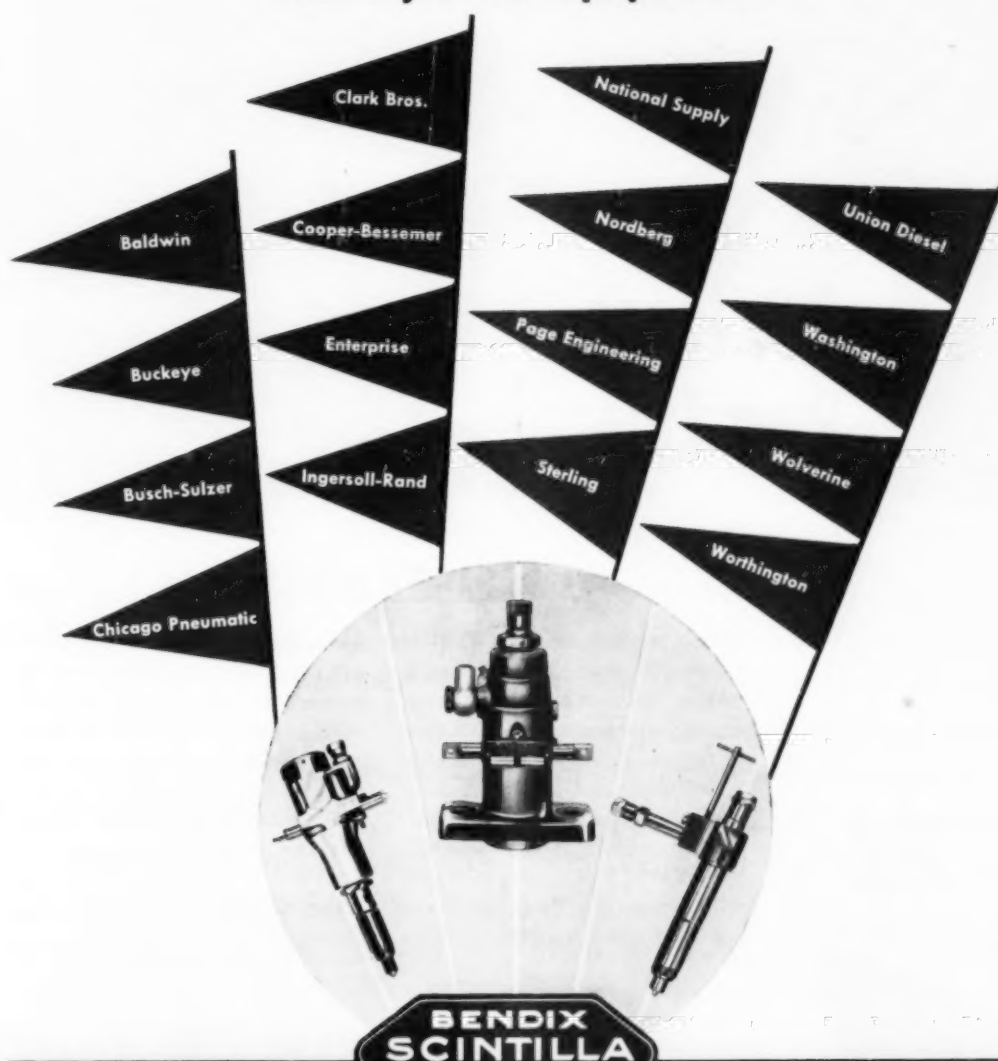
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Silbraz joints, made with Walseal® valves, fittings and flanges, actually make a "one-piece pipe line" of brass, copper, or copper-nickel I.P.S. pipe or tubing . . . leaky joints are completely eliminated, and maintenance costs are reduced to the minimum.

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with Walseal



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valves and fittings

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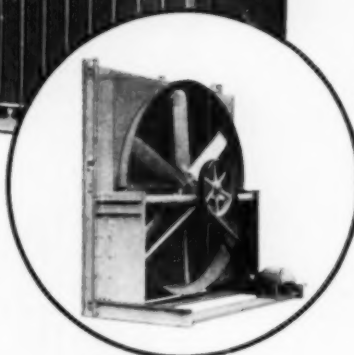
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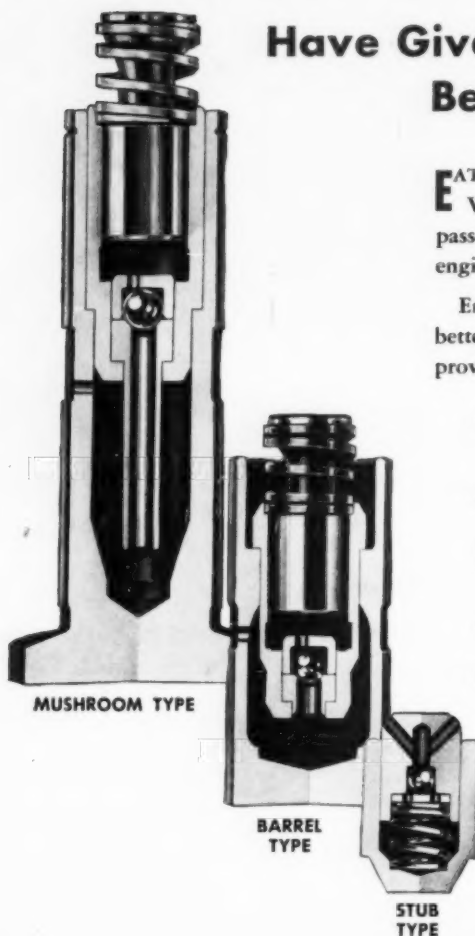
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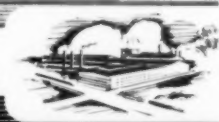
The **GIANT** *in the* **DIESEL**

THIS giant crank weighs 80,750 lbs. . . . that's fighting weight! Erie Forge craftsmen "trained" it down from ingot to finished crank . . . watched its progress as every pound of excess weight came off . . . as it was precision "tuned" to its present fitness to take the piston thrusts of the Diesel engine and turn them into power. Under *one control* from the raw to the finish . . . with *one responsibility* right here resting on Erie Forge Designers, Engineers, Metallurgists and Craftsmen, this Giant in the Diesel is typical of Erie Forge cranks, drive shafts, connecting rods and steel castings conceived and produced completely at Erie.

Consult with us on your specification requirements . . . our experience and facilities will be of value to you.



ERIE FORGE COMPANY, ERIE, PA.





YEARs of standout service have proved General Motors Diesel freight locomotives can continuously haul heavier tonnages over greater distances, economically, in quicker time than any other motive power.

On the Burlington lines, 29 General Motors freight locomotives placed in service at various times since January 1944, have been available for work 506,403 hours out of a total of 581,031 for an availability average of 87.2% and the Burlington's fleet of General Motors switchers, the first of which went into service in 1937, has an average availability of 94.7% of total hours.

Yes, indeed, the freight goes *through* behind General Motors Diesels with less wear on track; quicker acceleration; faster grade climbing; fewer service stops and lower fuel cost — all of which mean greater economies, efficiencies and profit in railroading.



ELECTRO-MOTIVE DIVISION

GENERAL MOTORS LA GRANGE, ILL.

Home of the Diesel Locomotive

B&W Diesel Engines

DIESEL MOTOR SHIPS
SHIP REPAIRINGS



BURMEISTER & WALT
GERMANY

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CONTENTS FOR JANUARY, 1949

| | |
|--|----|
| The New York Motor Boat Show | 20 |
| Repair and Maintenance of Heavy Duty Diesels | 28 |
| Atomic City Diesels | 30 |
| A New Hydraulic Governor | 31 |
| Diesel Pleasure Craft and Work Boats | 32 |
| Gas Turbine Locomotive | 34 |
| Soil Cement Paving Project | 35 |
| Diesel Fire Boat "Bernard Samuel" | 36 |
| Diesel Oil Filtration | 38 |
| D.E.M.A. Annual Meeting | 40 |
| Diesel Tug Sets Towing Record | 41 |
| Maintaining Diesel Efficiency | 42 |
| Diesel Whale Factory Ship | 43 |
| La Plata, Missouri | 44 |
| A New Truck Diesel Combination | 46 |
| Supervising and Operating Engineers' Section | 48 |

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MOTORBOAT SHOW . . .

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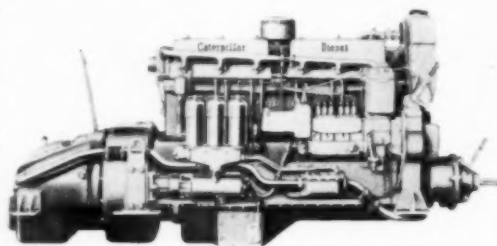
By GEORGE D. CROSSLEY

Caterpillar

The Caterpillar Tractor Company is displaying five of its ten marine diesel models. Two of the five are being shown for the first time and comprise two of the four engines notably new in the manufacturers' line.

The new D397 diesel marine engine has a continuous output of 400 hp. at a governed full-load speed at 1200 rpm. The engine has a piston displacement of 2493 cu. in. and is equipped with a Roots, gear-driven blower. The engine is V-type, 12 cyl. and has a bore and stroke of 5 3/4 x 8.

The all new D364 marine diesel has a bore and stroke of 5 3/4 x 8 and a piston displacement of 1662 cu. in. The engine has a continuous output of 220 hp. at governed full load speed of 1200 rpm. Also shown by the manufacturer are the D13000 marine diesel and the D315 marine electric generating set. The former (seen below) is a six cylinder 150 hp., 1000 rpm diesel. The latter is a 27 kw. diesel electric generating set driven by a 4 cyl., four stroke cycle, valve in head engine and operates at 1200 rpm.



Cleveland Diesel

ONE of General Motors' most widely used diesel engines, the Model 278A (seen below), will be exhibited by the Cleveland Diesel Engine Division. The 2-cycle engine utilizing the General Motors unit fuel injection system and uniflow scavenging, has proven itself very flexible in marine power plant history.

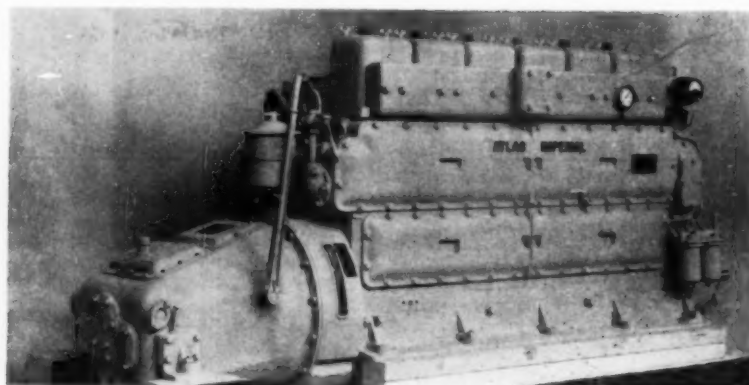
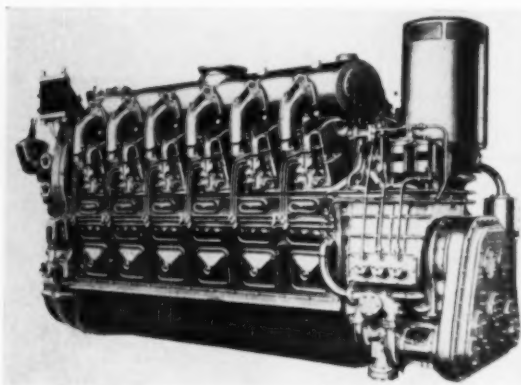
Available in either 6, 8 or 12-cyl units, the 278A is supplied for propulsion work with direct-connected generators for electric drive or with air-flex clutch and reverse gear. Auxiliary Model 71 engines range in size from 2-cyl. with 20 kw. to 6-cyl. with 60 kw.

George W. Codrington, vice president of General Motors and general manager of Cleveland Diesel Engine Division, who envisioned the extraordinary demand for engines from ship owners following the war, declares that his plant is filling orders that come from all parts of the world.

Atlas

Atlas Imperial Diesel Engine Co., will show a Model EM253 Marine diesel engine (seen below). This is a 6 cyl. 6 1/4 in. bore by 8 1/4 in. stroke, four cycle unit with a piston displacement of 253 cu. in. per cylinder and rated to develop 135 hp. at 900 rpm. With built-in reverse and reduction gear unit the engine is equipped with heat exchanger, fresh water cooling system and is air starting. A built-in air compressor replenishes the compressed air in the air receiver but an auxiliary air compressor unit is invariably supplied for stand by.

The engine is of "enbloc" construction with a separate sleeve or liner in each cylinder. The fuel injection system is American Bosch with individual pumps operated directly from the camshaft and the governor is Pickering, Model 2292. The net weight of the engine is 8250 lbs. A 4 cyl. unit rated 90 hp. at 900 rpm. weighs 6400 lbs. This type diesel was designed to meet demand for a compact, heavy duty, medium speed engine.



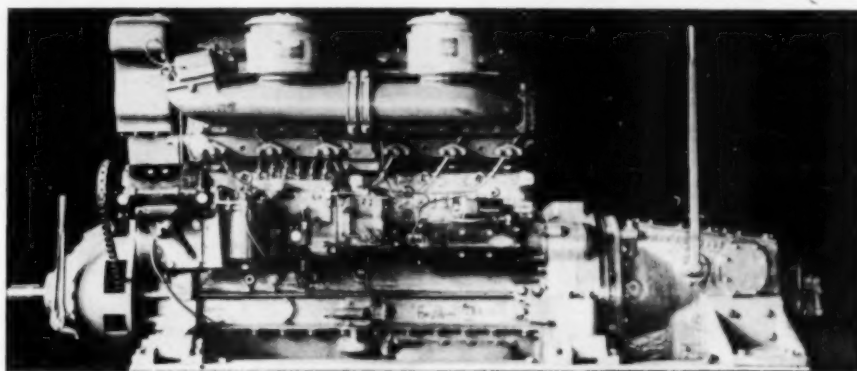
For many years now the New York Motorboat show has officially opened the yachting season. This year will be no exception and on January 7th, the doors of New York's Grand Central Palace will be opened for the 39th annual session. It promises to be the best show ever.

Boat enthusiasts, whether they own 200-ft ocean going vessels or 10-ft. dinghies, flock to the Show every year to see what's new. It is a recurring phenomenon peculiar only to sea-going landmen. They just love boats and show it.

Each year has seen an increase in interest in marine propulsion and auxiliary machinery at the Show. This is particularly true in the diesel engine field. A prospective yachtsman always inquires concerning diesel propulsion. The fast fading and erroneous conception that diesel engines are too bulky for small marine installations has been visibly disproved by thousands of marine diesels now in service. No less than 15 engine companies will show their models ranging from 2 to 1200 hp. These engines are briefly described below. Also described is some of marine auxiliary equipment at the show.

Cummins

Four models from the line of Cummins marine diesels and a cutaway version of the Exclusive Cummins Fuel System will be featured at the exhibit of the Cummins Engine Company, Inc. One of the Cummins Marine diesels in the exhibit will be the Model AM-600, with a rating of 58 hp. at 1600 rpm in continuous heavy-duty service, and a maximum rating of 100 hp. at 2200 rpm. Another Cummins marine diesel in the exhibit will be the Model NHM-600, with a rating of 132 hp. at 1800 rpm. in continuous heavy-duty service, and a maximum rating at 200 hp. at 2100 rpm. The third Cummins marine diesel in the exhibit will be the Model NHMS-600. This supercharged version of the Model NHM-600 has a maximum rating of 175 hp. at 1800 rpm in continuous heavy-duty service, and a maximum rating of 275 hp. at 2100 rpm. The largest Cummins marine diesel (seen below) in the exhibit will be the Model LM-

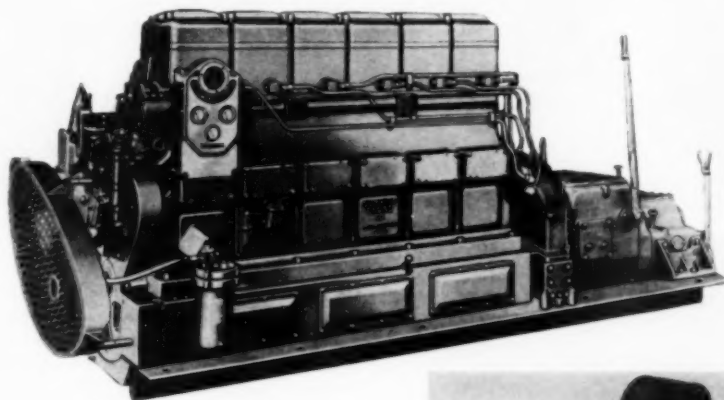


600. This six cyl. engine, with a rating of 177 hp. at 800 rpm for continuous heavy-duty marine service, has a maximum rating of 250 hp. at 1000 rpm.

Lathrop

The Lathrop Engine Company has developed a new diesel with double the power rating of any of its previous diesel models.

The new DH-200, six-cylinder, four-cycle diesel pictured above produces 187 hp. based on a continuous duty rating at 1600 rpm. Other specifications: 5 $\frac{3}{4}$ in. bore, 6 in. stroke, 935 cu. in. displacement, 87 in. over-all length. The DH-200 is available in direct drive or with reduction gears of 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$ and 3 to 1 ratios, all of which are interchangeable in the same housing. Regular equipment includes electric starting motor, 24 or 32 volt generator, American Bosch fuel system, instrument panel with connections, double lubrication filters, double fuel oil filters, heat exchanger, raw water pump and engine circulating pump.



Palmer

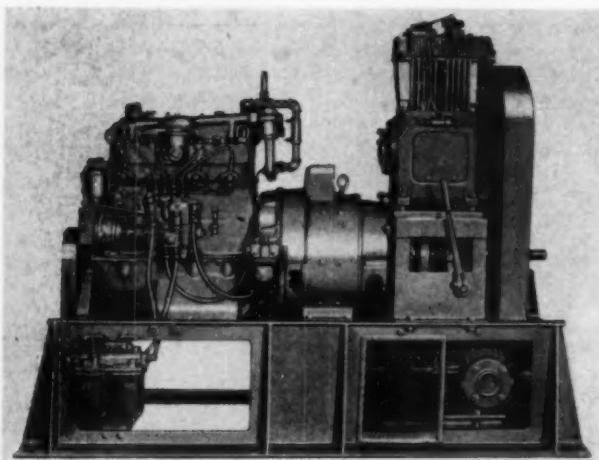
Palmer Bros. Engine Corp. once again occupies their usual place on the second floor of Grand Central Palace. Palmer engines have been exhibited at every Motor Boat Show through all the years that these Shows have been held. The Palmer line of RND diesel engines (see right) is shown. These diesels are greatly improved over the old line that was introduced in 1939. The fuel pumps are now mounted along the cam shaft instead of being driven by the rear cross-shaft. Practically all complications such as external piping, etc., have been eliminated. The one-cylinder model has a new type of flywheel housing, radiator and Twin Disc clutch. The starter and generator, Twin Disc power take-off and radiator are in one simple compact unit.



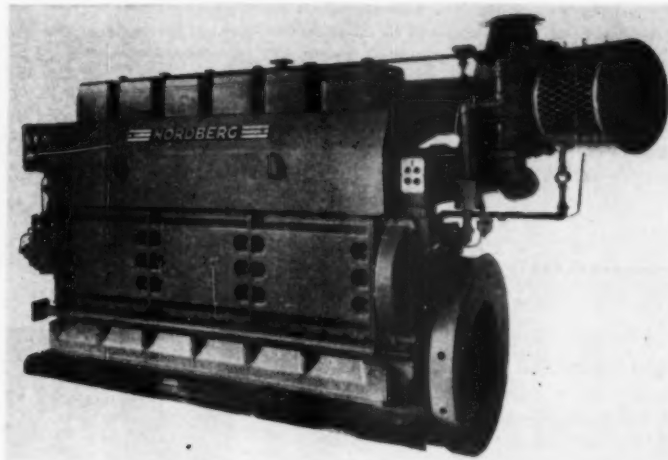
U. S. Motors

U. S. Motors offers a full line of diesel engine driven plants for pleasure yacht, workboat and general marine service in sizes ranging from 2 to 40 kw. On installations requiring compressors, bilge and fire pumps in addition to auxiliary generators, combination units with accessories to meet customers needs are supplied. The generator is direct connected to the engine while the other auxiliaries are independently clutch driven.

Over a period of many years, United States Motors Corporation has specialized in building marine engines in the lower horsepower range in sizes up to ten horsepower. With the increased demand for electricity on the smaller types of boats, auxiliary plants of low capacity are built by the company these can be installed with remote control starting equipment, thus making it easy for one man to operate the boat.



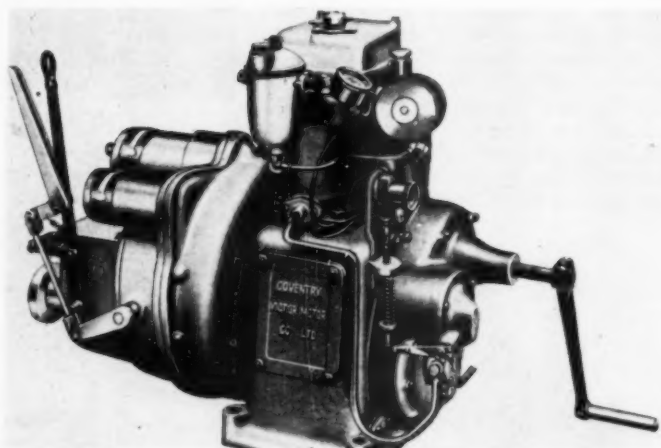
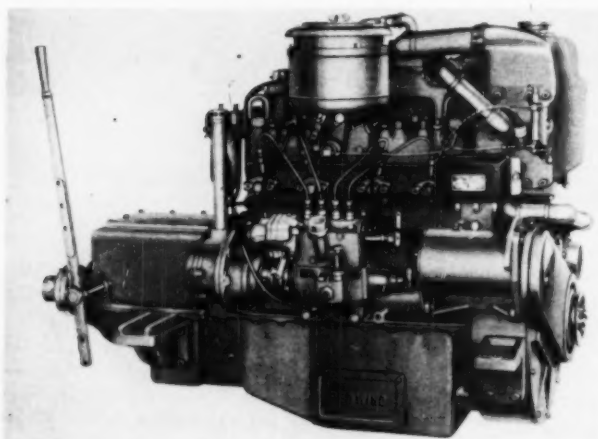
U. S. Motors 10 kw. Marine diesel electric plant with auxiliaries.



Supercharged, 9 x 11½ bore and stroke, Nordberg diesel.

65 hp. Red Wing diesel for marine service equipped with fuel oil and air filters.

Lightweight Coventry Victor diesel equipped with 2 to 1 reduction reverse gear.



Red Wing

The Red Wing Motor Company will show one diesel model at the Boat Show. It is the company's first diesel model. It is a 4 cyl., 65 hp., 1900 rpm. engine available with direct drive or with water-cooled, 2 to 1, or 3 to 1 reduction gearing. It is equipped with fuel oil and air filters and a large capacity oil cooler. The fuel injection system is American Bosch.

Cold weather starts are aided by a glow plug installation. The bore is 4¼ in. and the stroke is 4½ in. The displacement is 255 cu. in. Engine weight is 1250 lbs.

The company is rushing development of two more diesels of larger capacity for 1949. One is a 160 hp., 1400 rpm engine. The other a 200 hp. diesel at 1300 rpm. Red Wing is another engine company which realizes that the future lies with the diesel engine.

Redwing will also show a range of gasoline engines ranging from 18 to 90 hp. The company also manufactures a line of Hesselman engines.

Nordberg

Presenting engines in both high and low horsepower classifications, Nordberg Manufacturing Company will have a 1 cyl., 15 hp. diesel and a 6 cyl., 9 x 12½ in. bore and stroke marine diesel on exhibit. The latter engine develops 265 hp. at 600 rpm and is of the four cycle, direct reversing, mechanical injection type. It can be furnished with a sailing clutch for driving auxiliary equipment through a front power take-off. A single lever control system is utilized for directional and throttle control. In changing the direction of rotation the cam rollers are first lifted clear of the cams. This also lifts the exhaust valves clear of their seats thus venting the cylinders. Positive mechanical interlocks prevent starting air from being admitted to the cylinders until the camshaft is set for the desired direction of rotation. Fuel cannot be injected until one revolution has been made on starting air in the direction set. The new single cylinder 15 hp. diesel is built with a 4½ in. bore and a 5¼ in. stroke. It is built with a clutch or for direct connection. The engine is a completely self contained unit cluded as standard equipment.

Coventry Victor

On exhibition for the first time in the United States is a small British-built marine diesel propulsion unit. The Coventry Victor diesel engine is a small, light weight, high-speed, cold-starting water-cooled engine. It is available in two horsepower ranges: Model WD 1 from 5 to 7 at 1500 to 2250 rpm., and Model WD 2 from 7 to 9 hp. at 1500 to 2500 rpm. The maximum continuous operating speed is recommended at 1800 rpm. in both engines. The weights of these engines (bare): WD 1—220 lbs., WD 2—240 lbs. The weights with reverse and reduction gears are 290 and 310 lbs.

The engine is very compact and is suitable as an auxiliary for sailing craft up to 30 ft. in length where, with a proper combination of speed reduction wheel, seven knots can be logged.

The engine is easily started by hand even in cold weather. The starting handle is on the cam shaft so for every one revolution of the handle, there are two of the flywheel. A compression release eases starting. Twelve volt electric starting equipment can be furnished.

Onan

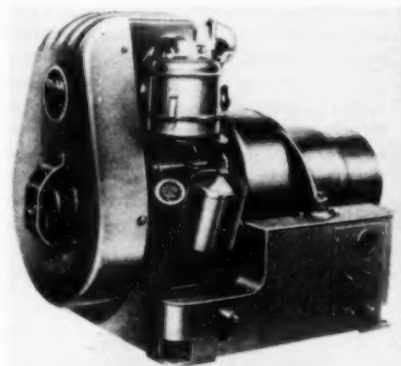
A 2,500 watt air-cooled diesel electric plant for marine use, developed by D. W. Onan & Sons, Inc. will be displayed at their exhibit. The new Onan DSP air-cooled diesel engine is the prime mover for this diesel electric plant. It is unusually compact (10½ cu. ft.). The application of air-cooling to this diesel engine simplifies servicing and reduces maintenance costs. It is economical to operate; approximately 0.135 gal. of fuel is required per kw. hr. at full rated load.

Electric cranking of the engine is made possible by a specially designed automatic compression release which is built in.

Another Onan diesel-electric plant, a 10,000-watt marine model will be seen. This model is powered by a Buda diesel.

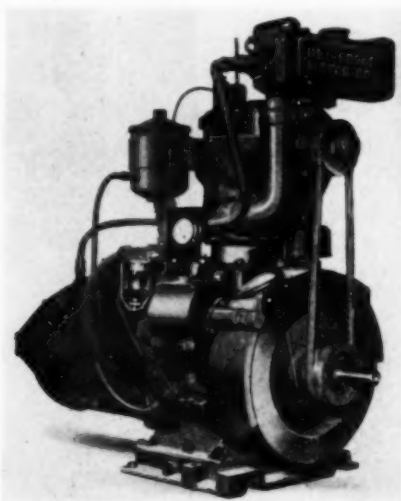
Universal

At the Universal exhibit an entirely new 1 cyl. marine diesel generating plant will be shown. It is a 2 kw. water-cooled power plant. It is a completely self-contained plant with built-in fresh water cooling and 12 volt electric starting. It is less than three feet in length and three feet in height, and is therefore suitable for installation



2½ kw diesel electric set shown by Onan Products.

Universal 2 kw marine diesel generating set.



where available space is at a premium. Universal has recently announced a new line of diesel generating sets ranging up to 35 kw. capacity.

Stern Tube Bearings

Twenty-fifth anniversary of the use of Cutless rubber bearings in marine service will be celebrated at the show.

An exhibit of Cutless bearings for motor boats, by Lucian Q. Moffitt, Inc., national distributors for the product, manufactured by The G. F. Goodrich Company is included in the show. Coincidental with this year's exhibit, it is announced that all Cutless bearings are now being made with



Goodrich Cutless bearings.

Ameripol man-made rubber, developed by B. F. Goodrich, which effectively resists oils, greases and chemicals. This will further increase life of the

bearings, as waste chemicals, oils and sludges usually found in both coastal and inland waters will not affect the rubber linings.

Entering a Cutless rubber bearing, grit and sand particles simply depress the soft lining and as the shaft rotates, are pulled along, worked into longitudinal grooves and washed away by the action of the water before damage results.

In addition to their principal function of reducing bearing and shaft wear and maintenance, Cutless rubber bearings also decrease noise and vibration, which are easily transmitted, through the boat from hard surface bearings. These annoying effects mount as wear increases. The soft rubber lining in Cutless rubber bearings acts as a shock absorber and noise insulator and reduces wear caused by misalignment.

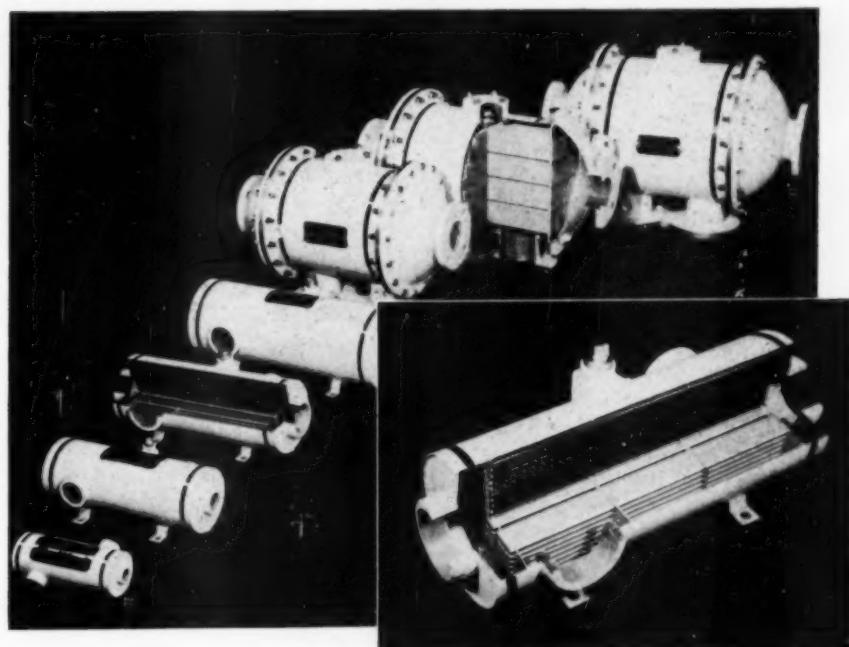
Heat Exchangers

The Harrison Radiator Division of General Motors will show their line of heat exchangers. The new light weight, all brazed oil and water coolers, introduced last year at the show will be featured again. These coolers are offered in a complete range of progressive sizes to cool all size installations. In addition Harrison will show its plate and strut tube type cooler. The plate type cooler consists of a series of cooling plates enclosed in a cast metal housing. The individual plates consist of an upper and lower stamping of non-ferrous metal alloy, which enclose a distributor strip that breaks up the oil stream.

Navigation Equipment

The Sperry Gyroscope Company will show its Magnetic Compass pilot which has recently been put in quantity production. This new automatic pilot will be mounted on a sleek model boat in

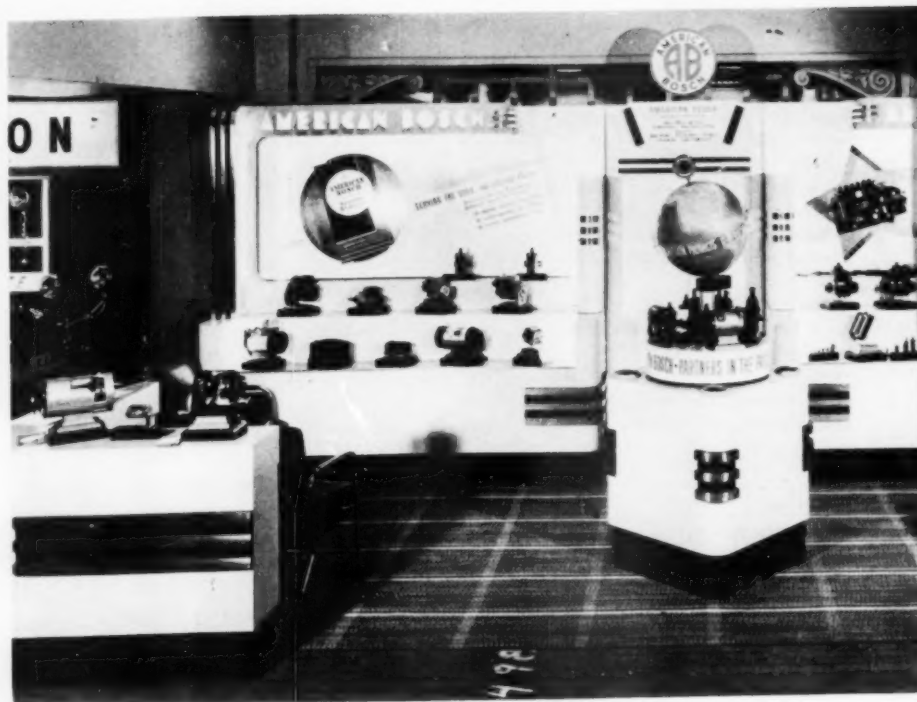
Coolers shown by Harrison Radiator Division.



the Sperry booth for demonstration purposes. This unit is simple, and easy to operate. The equipment consists of a course setting knob and a course indicator attached to a standard magnetic compass. When the course is "dialed" by the knob, the boat turns to the new course and holds it automatically. The sensitive pick-off equipment senses the compass reading and applies the rudder through a power unit or steering engine. The pilot itself requires little power using either 32 volt or 110 volt DC. An accessory to the magnetic compass pilot is the remote steering controller which permits rudder changes from parts of the vessel away from the helm. This is accomplished by a small control connected to the compass pilot by a flexible cable.

Reduction and Reverse Gears

Several manufacturers of marine reduction and reverse gears will be represented at this annual show. Among them will be Twin Disc Clutch Company and the G. Walter Machine Company. The latter concern has developed a new marine reverse gear and a combination reverse and reduction gear. The new reverse gear is designed for high speed engines and will carry 100 hp. at 3000 rpm. It features fast reversing action. The new reverse and reduction gear combination is offered in standard ratios of 1.67 to 1, 2.11 to 1 and 2.73 to 1. Other reductions are available. Another unit to be shown is a reduction gear power take-off. This consists of the reduction gear



American Bosch booth at the Motorboat Show.

with extended pinion shaft and Twin Disc clutch and is applicable to engines not factory-equipped with a power take-off.

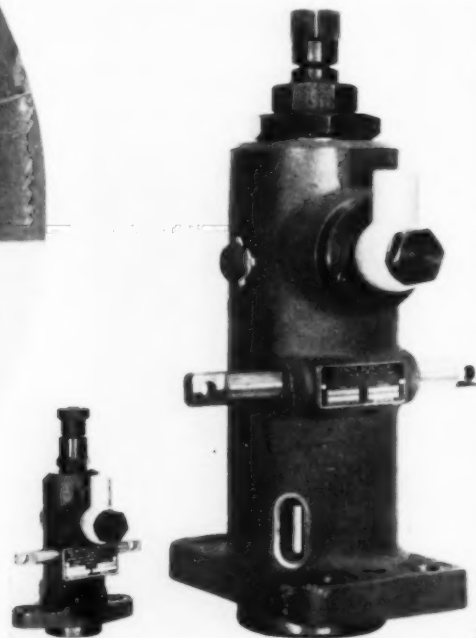
Fuel Injection Equipment

Both American Bosch and Scintilla Magneto Division of Bendix will show fuel injection equipment at the show. Always interested in the marine field these two concerns will have experts in fuel injection problems at their respective booths. Scintilla representatives will include A. J. Poole, Jr. and L. O. Mjolsnes for diesel equipment consultation.

Installation view of Sperry Magnetic Compass Pilot.



(Right) Bendix Scintilla fuel injection pumps.



DIESEL PROGRESS



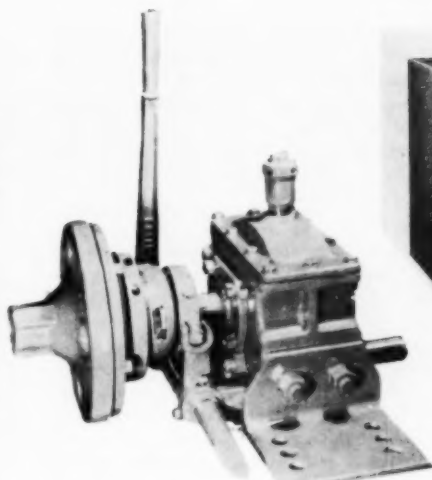
Taking a prominent place in the American Bosch exhibit will be the very comprehensive line of diesel fuel injection products offered today which includes fuel injection pumps of the single and multi-cylinder types, governors, supply pumps, timing devices, nozzle holders, nozzles and final stage filters. Some of these products have been sectionalized to show the operation of the inner precision parts. This equipment ranges in sizes to serve diesel engines from the small auxiliary types of several horsepower to the largest engines.

Marine Heaters

In the relatively new field of marine air heating, Anchor Post Products, Inc. will show its line of "dual fuel" Marine Heaters. These Fluid Heat units deliver 15,000 Btu's. per hour and are available for 6, 12, and 32 volt systems. The units will burn kerosene, gasoline or diesel fuel without modification and consume only .15 gallons of fuel per hour. Since their introduction at the 1947 show, hundreds of these units have been placed in yacht and work boat service. The heaters are approved by Marine Underwriters.

Engine Controls

In the field of engine controls Sperry Products will present its hydraulic models for gasoline and diesel engine installation. A Packard marine engine and a General Motors series 71 marine diesel engine will be displayed with working hydraulic controls for both throttle and clutch operation. Sperry furnishes control mounting kits for both types of engines. The type F controls used for the diesel installation are rated at 400 and 150 lbs. respectively for the pressure and return strokes. The mounting kits offered by Sperry are designed to fit General Motors 71 series diesels.



G. Walter Reduction Gear Power Takeoff.

Fuels and Lubricants

Leading oil companies including Texas, Gulf and Esso Standard will have booths at the show. Esso Standard will hold open house at its Cruising Service Center. Specialists will explain to visitors the various aids to yachtsmen which have been developed by the company.

Gulf Oil Corporation representatives at their booth will demonstrate a new method for removing gum deposits from boat fuel systems. Gulf will also have its Cruisegide Bureau set up for the service of booth visitors.

Fire Extinguishing Systems

Emphasis on proper fire protection for marine installations will be stressed by Walter Kidde and CO-TWO in their respective exhibits. All the modern methods of combatting oil, gasoline and electrical fires will be demonstrated by these concerns. Walter Kidde will present an animated display showing an automatic built-in carbon dioxide system and how it works.

Engine Silencers

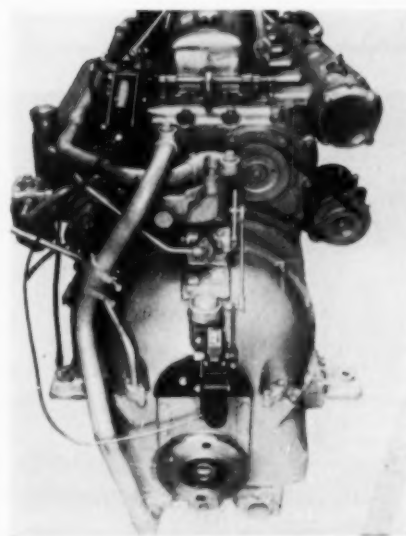
The Maxim Silencer Company will show several models of both the wet and dry type silencer. The wet type will be shown in two distinct types—those for use with engines installed above the waterline and those for use with engines below the waterline. In addition the company will show its new light weight plow anchor.

The Model M3 Maxim Silencer for engine installations above the water line consists of one casting of the best grade of grey iron. The design consist essentially of three pots in series, with an ingenious orifice or passage between each one. This passage is designed to utilize the water in the exhaust to the greatest possible degree. The M4 model is practically the same as far as design goes but is suitable for smaller installations.

For engines below the water line Model TR



Anchor Post Products Marine Heater.



Sperry Products Hydraulic Controls on G. M. diesel.

Silencers are recommended by Maxim. This model is so designed as to prevent water from running back into the engine and at the same time provide a wet exhaust. The silencer is constructed of four grey iron castings which are resistant to corrosion and electrolytic action. The unit can be supplied in aluminum alloy if conditions so require.

Radio Equipment

Yachtsmen interested in the latest developments in radio-telephones and direction finders will find the R.C.A. booth an interesting one.

The R.C.A. combination broadcast receiver and two-way radio-telephone is a long awaited development. The unit is compact—9 x 9 x 13½ in.—with a built-in loudspeaker. It can utilize six or twelve volt DC current.

The R.C.A. combination radio direction finder and broadcast receiver is also shown. This unit is designed for shelf or table mounting and utilizes either an inside or outside loop antenna.

Gray

The Gray Marine Motor Company reports that a substantial percentage of its total production is now going to commercial users for installation in workboats. At the Boat Show Gray will show its diesel and gasoline line.

Graymarine diesels, which are of the four-cycle type with Bosch injection pump, all have fresh water cooling as standard equipment, including "Keel Kooler" outboard-type heat exchanger. Inboard-type heat exchanger is optional. Two 4-cyl. models and one 6-cyl. model are offered, rated 30, 50 and 140 hp. respectively, for continuous marine service.

Complete equipment for the needs of workboat operators is available on all Graymarine heavy-duty engines, including Twin Disc power take-

off, oversize 20 ampere constant-voltage generator, 12 volt starting and lighting circuit to replace standard 6-volt, extra generator 6 volt or 12 volt., magneto ignition, and radio shielding for installations with radio telephone. Reduction gears are stocked in ratios of 1.5:1, 2:1, 2.5:1, 3:1 3.5:1 and 5:1 for a well rounded selection.

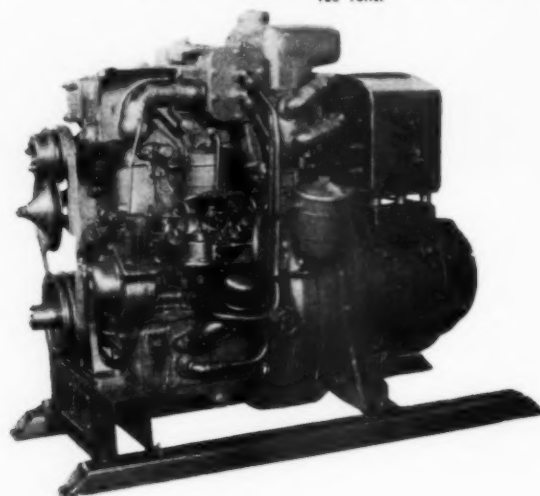
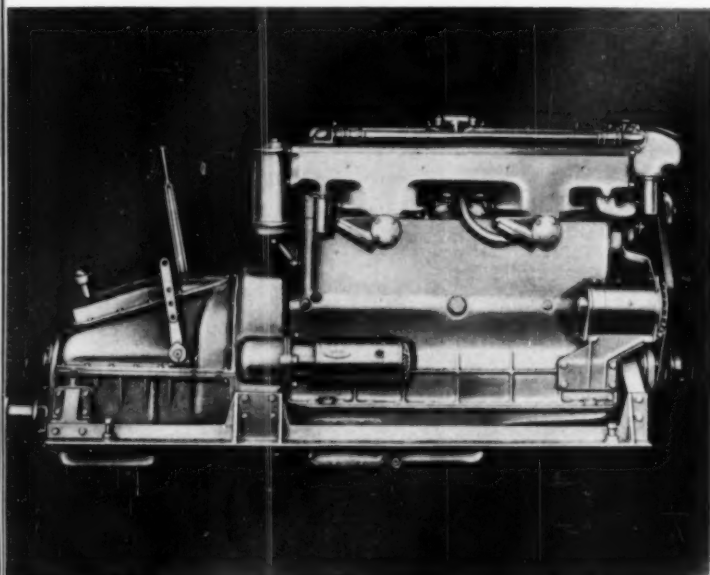
Buda

The Buda Company will feature two all new diesel engines, entirely new from stem to stern. Buda's newest and largest development for 1948 being shown is the 8-DCSMR-2505. This supercharged marine heavy duty diesel engine is principally for fishboats and towboat service. The supercharged 2505 is an 8 cyl. engine having a 6 $\frac{3}{4}$ in. bore and 8 $\frac{3}{4}$ in. stroke and developing over 400 hp. Engine is equipped with 2:1 Western Marine gear, with power take-off mounted

on rear of engine, thus giving shorter engine length and eliminating excessive shafting.

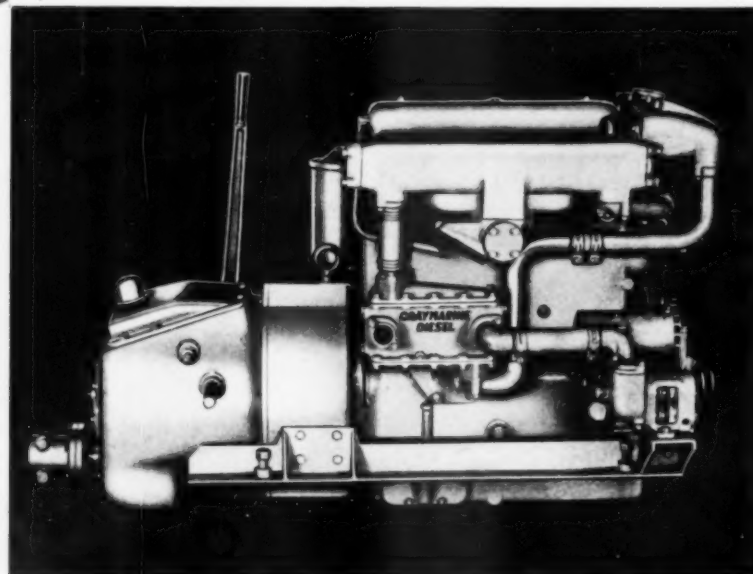
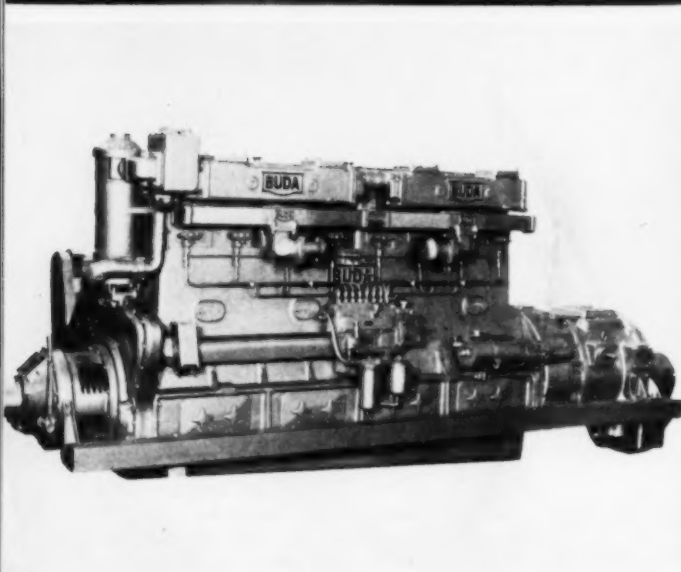
Also being shown for the first time is the Buda 3 kw., 32 volt diesel-electric marine generator set. This 1 cyl. diesel generator makes a very compact unit which is ideal for auxiliary generating service. It is furnished complete with controls and mounted entirely on its own base. The 1 cyl. engine that drives this generator set is one of the new BD series of high speed, compact low weight engines. In addition four other diesel marine engines and one marine generator set will also be exhibited. These will include a 4-BDMR-153 diesel marine engine, a 6-DTMR-317 diesel marine engine, a 6-DCMR-844 heavy duty diesel marine engine, a 6-DCMR-1879 heavy duty diesel marine engine, and a BDM-6 "D" 6 kw., 125 volt marine diesel-electric generator set.

This Gray marine diesel is rated 150 hp. It has a 573 cubic inch displacement.



(Below left) Buda's largest and newest diesel is this 400 hp. 8-cylinder engine.

(Below Right) Four cylinder Gray marine diesel rated at 50 hp at 1800 rpm.



Detroit Diesel

With the raising of the curtain on the 1949 edition of the National Motorboat Show, Detroit Diesel is presenting an entirely new version of the multiple engine arrangement: a 400 HP Twin-6 Series 71 Diesel unit in tandem. Measuring only 37½ inches in overall width, the tandem model was specifically designed for and is adaptable to boats of narrow beam or extreme deadrise.

The two 6-cylinder General Motors Series 71 Diesels are mounted back to back on a sturdy channel beam base with both driving a common spur or "bull" gear through a pinion splined to the drive shaft. Each engine is equipped with its own General Motors hydraulically operated reverse gears which are operated in unison by a common selector valve. Hydraulic disconnect valves for each gear box permits either engine to be completely disengaged without disturbing the other. This makes possible considerable operating economy during sustained periods when the full propulsion power of the unit is not needed. A master station with synchronized throttle controls is mounted directly above the unit. Provision has been made for pilot house as well as engine room connections that can be operated independently of each other.

The tandem twin can be delivered with any one of five different gear box ratios ranging from 1.75:1 to 6:1. A choice of heat exchanger or keel cooling as well as port or starboard engine rotation is offered. All working parts are easily accessible. For example, the reverse gear boxes can be inspected by simply sliding either engine back on tracks that have been made a part of the engine mounting base.

Other marine propulsion units in the Detroit Diesel Engine Division's power display include a pair of 200 HP 6-cylinder Series 71 Diesels for installation in twin screw boats. Port and starboard engines rotate in opposite directions and each is equipped with outboard manifolds. Principal accessories are mounted on the inboard side so as to be accessible for routine inspection and servicing of the unit.

Detroit Diesel also offers a 175 KW diesel driven generator set suitable for either main ship power or auxiliary use. This new electrical power plant consists of a 1200 rpm Delco generator direct connected to a Twin-6 cylinder General Motors Series 71 diesel engine. Both units are mounted together on a common structural steel base. The engines can be furnished with either heat exchanger or radiator cooling. Where the generating set is to be used for auxiliary ship's power an automatic starting device can be supplied as an optional equipment item. Another option is a single hydraulic governor for the two engines in the twin unit. During periods when the plant's full power is not required one engine in the twin combination may be easily and completely shut down and fuel saved.

For lesser power requirements Detroit Diesel is presenting a line of packaged single engine electrical sets ranging from 20 to 60 KW. All General Motors Series 71 Diesel driven marine generating

plants are built to conform with ABS and Maritime Commission specifications and can be delivered with such certification on request.

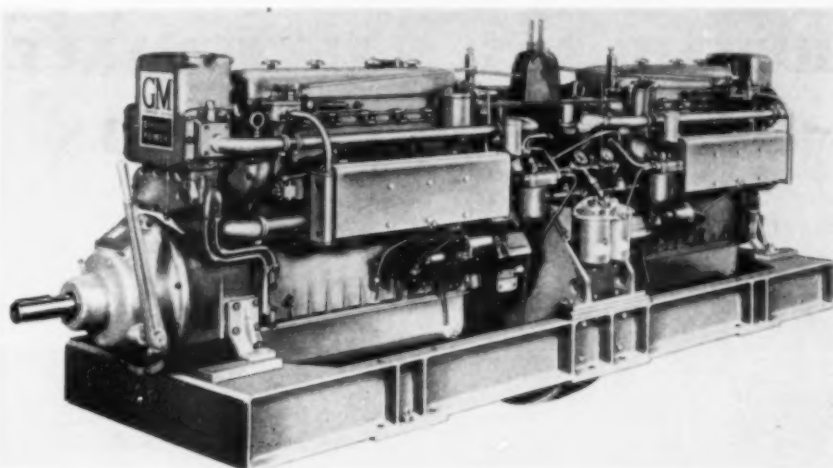
Special interest items in the Detroit Diesel Engine Division exhibit include a chromium plated rotating cutaway of a basic Series 71 Diesel engine and a static cutaway of a 6-cylinder marine model with hydraulic reverse gear.

One of the outstanding and unique flexibility features of the General Motors Series 71 2-cycle diesel engine is the fact that its symmetrical cylinder block permits assembling 2 or 4 basic engines on a common mounting so as to drive a single output shaft. This grouping of small high speed diesels has permitted boat owners and naval archi-

tecs to anticipate greater horsepower in terms of far less space and with greater flexibility than was ever before possible. It is not surprising therefore, that these multiple engine combinations gained immediate popularity in the marine field where greater horsepower requirements and engine room space limitations were so often in conflict in the past.

General Motors Twin-6 (two 6-cylinder engines mounted side by side) as well as Quad-6 marine diesel propulsion units have been in steady production since the close of the war.

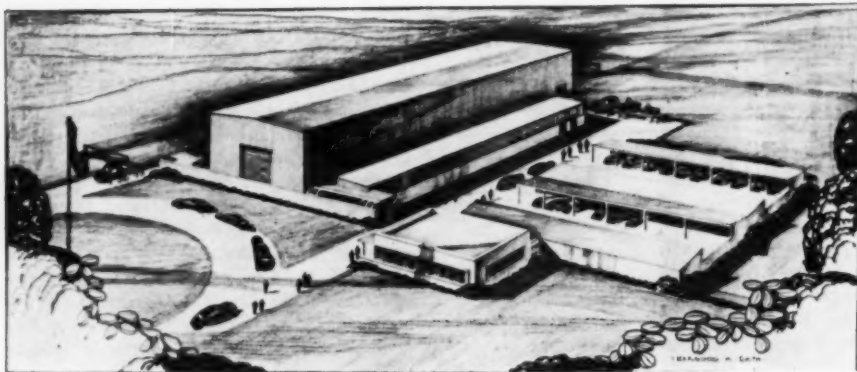
These multiple engine units offer a very definite advantage over a single auxiliary source of power on shipboard.



The GM series 71 Twin-6 tandem marine diesel engine rated at 400 hp shown with 35 hp. front power take-off. Gear box to propeller shaft coupling is mounted directly beneath aft engine.

Scale model of Detroit Diesel exhibit at Motor Boat show.





View of proposed plant for Washington Iron Works, Inc. to be located mid-way between Sherman and Denison, Texas, on U. S. 75.

REPAIR AND MAINTENANCE OF HEAVY DUTY DIESELS

By WILL H. FULLERTON

THE long life, low up-keep cost, as well as the reliability and economy of the diesel engine is amply proven by experience in its wide field of application. Its flexibility and dependability are well established. Heavy maintenance and repair service and the facilities developed for reclaiming large parts such as crankshafts, cylinders, frames and bed plates, which have been available for many years to engine owners in this country, have contributed importantly to the reputation and the efficient performance of diesels.

Any machinery, regardless of its efficiency, is subject to breakdowns, unforeseen accidents and failures at some time. The development of repair and maintenance services has been desirable.

One such repair service is offered by the Washington Iron Works, Inc. of Texas. In the heavy duty diesel field, many crankshafts, cylinders, liners, pistons, bed plates, frames etc., would have to be scrapped unless there was available a shop equipped to handle these large parts. Many diesel engine owners throughout the country for more than a quarter of a century, have followed the practice of sending such parts to this diesel repair shop at Sherman, where such parts are repaired, or replaced, and put back in service or stock as the occasion demands.

In this shop, it is the custom to handle any kind of diesel repair. There is in use, practically every facility in the line of machine shop equipment required for engine repair and rebuilding. Experience in handling difficult reclaiming operations, as well as in manufacture of many of these

parts, has been built up over the years. A corps of experienced service men are available for the maintenance work "on location." Established more than seventy years ago, this shop has, during its entire history, handled general engineering and heavy machinery repair business, having become an outstanding heavy duty machine shop in the days of the steam engine. However, for the past forty years, the facilities of this shop have been devoted almost exclusively to the maintenance and repair of large diesel engines. The facilities comprise many special machines and portable precision tools, which have been developed in the shop for use in the field for making numerous emergency repairs to heavy parts on location. Much of this special repair work is carried on without completely dismantling the engine.

One of the outstanding jobs of work found in this shop is that of crankshaft rebuilding. Repair work is done on any shaft from the largest, down to the smaller industrial engine shafts. These shafts are repaired, regardless of the nature or the location of the fracture. The shafts are refinished in perfect alignment without reducing any journal or crankpin diameters, if desired. The fractured sections are cut out of the shaft, and new forged sections shrunk in the place of the damaged sections and—in the case of larger shafts—the cost is only a fraction of the cost of a new one. Straightening bent shafts in the field without removing them from the engine is one of the special services rendered by this shop. All bent shafts are brought within the limits of a new shaft by this method, so far as alignment is concerned.

The crankpin surfaces on worn shafts of any size are refinished by special crankpin turning machines, designed and built in the shop for this service. These machines are also used in the field for reconditioning crankpins on location without dismantling. A 60" x 56" Niles lathe, with crank pin finishing attachments is used for refinishing the larger shafts.

Engine bed plates, frames, cylinders damaged by accidents are also repaired. This is accomplished without altering either the efficiency or the appearance of the unit. Welding on many such heavy parts is regular practice, and is accomplished by a special process with controlled temperatures which prevents distortion of parts, with the entire job finished in perfect alignment. Such repairs to heavy frames damaged by accident have been made on engines as far away as Massachusetts, New York, Mexico, Alaska and Philippine Islands.

This type of service is a saving in dismantling and erecting cost, as well as the cost of new parts, to which must be added the saving in time required by other methods.

Cylinders and liners of any size or design are ground to any pre-determined oversize and fitted with new pistons and rings. Likewise, old pistons are reconditioned, fitted with new pins and placed in undersize liners. All the cylinder and liner surfaces are ground, and by actual tests, give longer efficient service than bored cylinders. In addition to the finishing methods and the use of special alloy irons, all piston and liner castings manufactured by this shop are subjected to a special normalizing process before finishing—a process that eliminates all casting strains and distortions in service.

All bearings are given attention with regard to the quality of the virgin metal used, the control of temperature in handling and the bond between the bearing metal and the bearing shell. This makes for long life under service conditions, and precision machining methods used reduce scraping and fitting in the field to a minimum.

Emergency work is given particular attention. The cost of such work is based on time and material required to make the repairs. Representatives travel anywhere in North America, make estimates, and suggest repairs.

Many diesel units used in important fields of service, such as pipe line pumping stations, municipal power plants, utility plants, motor vessels, railroad equipment, etc., have been rebuilt and put back in service in remarkably short periods of time.

Another service offered, especially to operators of smaller plants who for economical reasons find it impractical to have their own trained maintenance crews, is a periodical inspection by men thoroughly trained in the servicing of Diesel engines. Arrangements may be made for checking crankshafts for misalignment, cracks, wear, etc. Bearings, liners, and all moving parts subject to

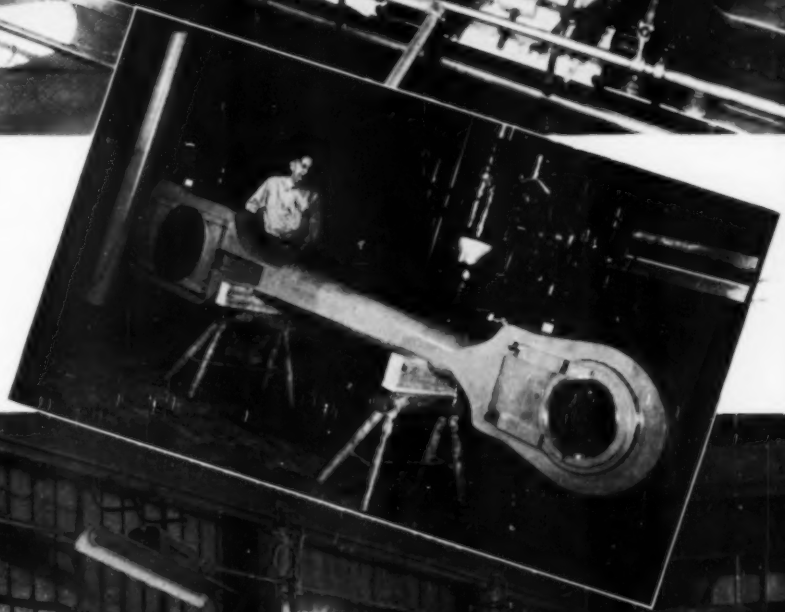
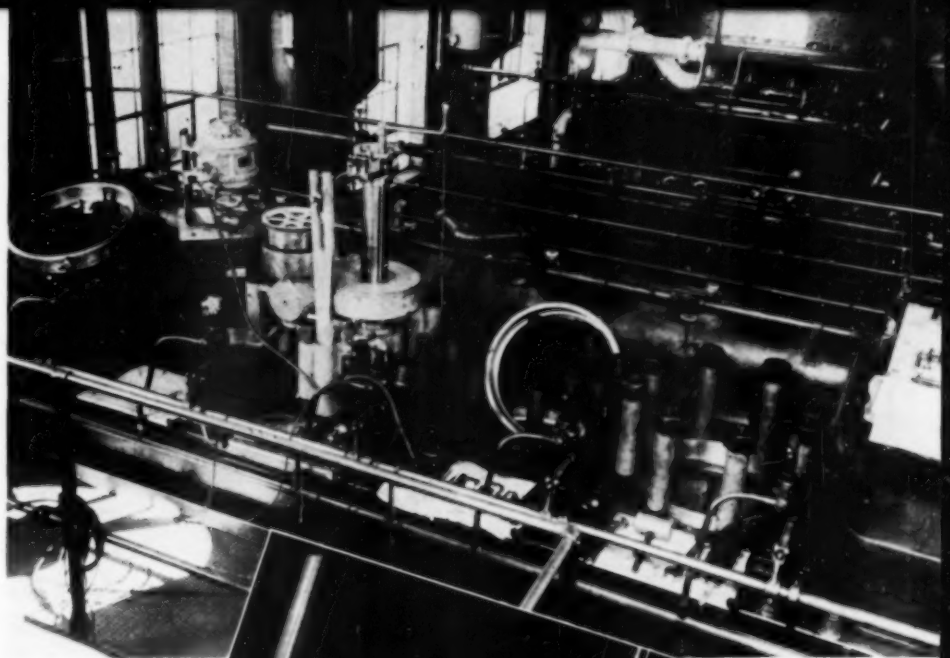
wear, as well as rod bolts, and other parts under continual stress, are carefully inspected, with the necessary replacements, and adjustments made for longer and more economical service. To those contemplating the purchase of used equipment, a thorough inspection service is offered, and an unbiased opinion furnished as to the condition of all parts, as well as an estimate for complete reconditioning of these parts.

Increased volume of business, the enormous size of some diesel parts and new developments in the field of repair, have combined to produce a crying need for larger, more efficient quarters and handling facilities. This has been answered by the purchase of a tract of land between Sherman and Denison, and blueprints and specifications are now ready for building a new plant in the near future.

(Above right) Large diesel in a Mississippi power plant being repaired. Cracked and leaking liner seats replaced with forged steel seats. All work completed on the job.

(Right) Connecting rod from large engine which had both eyes remachined and new bearings made and installed.

Crankshaft from a German-built diesel being straightened and refinished at Washington Iron Works, Inc., of Sherman, Texas.



ATOMIC CITY DIESELS

By W. J. GRANBERG



This 120-ton American Locomotive Co. switcher is one of the ten diesels operating on the Hanford Works railroad.

PROPERLY enough, the railroad and highway transportation system at Hanford Works is as modern as the atom bomb. This unit of the nation's atomic energy manufacturing system boasts its own railroad which hauled the literally countless thousands of tons of materials required to build this "best kept secret of the war." That was in 1943 when "Manhattan Project" was an unknown quantity, and the rail lines locomotives were something no self-respecting railroad would own—29 hand-me-down coal burning and hand-fired jobs that looked like refugees from a scrap steel yard.

Today, 10 modern diesel electric locomotives are doing a hauling job reminiscent of 1943, and there isn't a steam mallet in sight. Hanford Works, operated by General Electric Company under contract with the Atomic Energy Commission, is the site of an expansion program which will cost from \$300,000,000 to half a billion dollars making it the nation's largest peacetime construction job ever undertaken.

The atomic city's railroad, which is federally-owned, has 180 miles of track in and approaching Hanford Works, which sits beside the Columbia

River in southeastern Washington, 160 miles southwest of Spokane. The 10 diesel locomotives handle an average of more than 5,000 cars per month, owning 70 pieces of freight handling equipment itself and handling those of other lines to get them in and out of Hanford.

Two of the locomotives are 120-ton Baldwin yard switchers, carrying eight-cylinder 1000-horsepower Baldwin diesels which drive Westinghouse generators. There are also two 120-ton American Locomotive diesel road switchers. There are four 80-ton General Electric switch engines, rated at 660 horsepower. These employ two 330-horsepower Cummins diesels, Model L super-charged, six cylinder. Two 65-ton General Electric switch engines, rated at 500 horsepower, carry a pair of Model H Cummins Diesels super-charged.

Operation of Hanford Works takes more than material, however and the thousands of men and women employed in the administration of the project and the manufacturing end of it must be transported to their jobs in Richland and at the plant itself. Until 1943 Richland was a sleepy little crossroads hamlet of 242 persons engaged,

for the most part, in fruit raising. Then came "Manhattan Project," the bulldozers, the builders, and the village became a modern, planned city of 15,000 people. Contrary to expectations, the town was not abandoned at war's end and today the population is at least 25,000.

Transportation of personnel demands buses, and the fleet operated by General Electric now boasts 62 new General Motors Corporation 41-passenger, suburban type Diesel coaches. They comprise the Richland Village Bus System and in one month haul more than 180,000 passengers on point-to-point routes, to say nothing of the countless thousands carried on shuttle rides.

The new coaches are Model 6-71 jobs two cycle, six-cylinder, and develop 165 horsepower at 1200 r.p.m. Bore is four and one-quarter inches and the stroke five inches. The displacement is 425.3 cubic inches. Operating the clock around, the buses are kept in the best of shape in the system's own maintenance shop in Richland, while the rail line's locomotives are kept in repair at the roundhouse at Riverland, the freight interchange up the river from Hanford.

The destination sign on these new GMC diesel coaches reminds one that "security" is the watchword at the Hanford Works. 62 of these buses are now in service transporting 180,000 passengers a month.



NEW HYDRAULIC GOVERNOR

THE Woodward Governor Company's entry into the diesel engine control field came about a number of years ago when it was learned that Woodward Governor equipped waterwheels were taking control away from diesel engines being operated in parallel with them. In spite of the fact that governors controlling the hydro-electric units must be limited as to rate of gate movement, the bulk of frequency control of systems on which hydro and diesel units were paralleled fell to the waterwheel governors. The lighter, potentially faster diesel engines were handicapped by the slow, insensitive mechanical governors then in use.

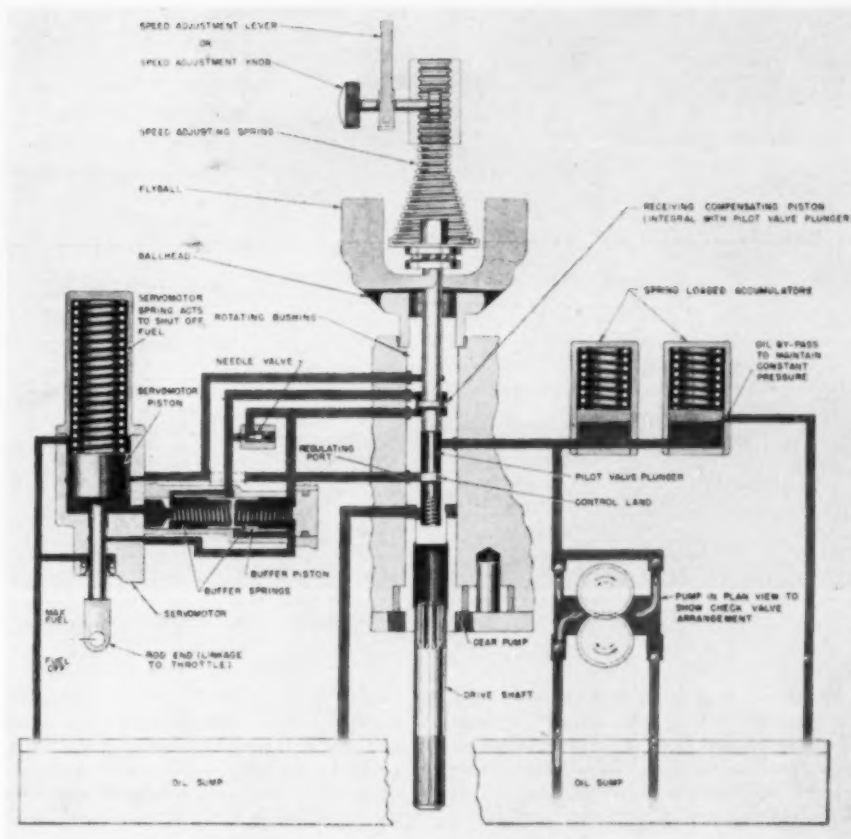
The first step in expansion of the Woodward line to prime movers other than hydraulic turbines, was the adaptation of a standard waterwheel governor to a diesel engine. This experimental installation was highly successful and it was therefore decided to proceed with the design and development of a line of governors suitable for internal combustion engines. The first of these governors was the type IC, which was developed during 1932 and was intended particularly for stationary central service. About this time it became apparent that the internal combustion engine field also required a smaller governor adaptable to many different configurations and that this governor would also be applicable to steam engines and steam turbines. The SI governor was then developed as an entirely new design under which friction of operating parts was minimized to obtain sensitive and accurate control.

The basic design of this governor proved to be so satisfactory that its use was extended to many different types of installations, and numerous auxiliary devices were developed to give it the necessary flexibility. These included electro-hydraulic and pneumatic-hydraulic speed control for locomotive use, the speed droop mechanism, torque limit control and many others.

The research and development work that produced the type SI governor has been proceeding through the years in an effort to explore all aspects of governing. One of the results of this continuing development work has been the evolution of another new design which is even more important than that of the friction reducing rotating sleeve incorporated in the first SI governor.

The first governor to which this new compensating system has been applied is the PG, which has been designed to be interchangeable with the SI as to dimensions and work capacity. All auxiliary devices used with the SI are applicable to this governor.

The design of the compensating system gives it the desirable characteristic of being able to provide more nearly the proper degree of stabiliza-



Schematic diagram of new Woodward type PG governor.

tion over a far greater range of varying engine characteristics than do the older systems. The receiving compensating piston is essentially frictionless and thus is able to respond to the most minute compensation impulses. For small, slow movements of the governor power cylinder, the rate of compensation increases. This factor, plus the lack of friction, results in greatly improved on-speed stability. Because the compensating impulse is more accurately and directly transmitted to the flyballs, far less compensation is required than hitherto. This permits the governor to make corrective movements with greater speed and stability. The volume of oil handled by the needle valve has been multiplied several times. This, plus the improved compensating characteristics, makes the control far less sensitive to needle valve adjustment.

The schematic diagram accompanying this article shows the general principles of operation of the PG governor. It will be noted by those familiar with the type SI, that the power and speed sensing components of the PG governor are very similar

to those of the SI and that the principle difference lies in the compensating system. Instead of transmitting indication of power piston movement to the pilot valve bushing to obtain temporary speed droop for restoring (as in the SI), force is transmitted to the pilot valve plunger as the oil flows to the servomotor. Movement of the oil to the area below the servomotor piston displaces the buffer piston, creating a pressure differential between the two sides of the piston. This pressure differential is applied to the large diameter of the pilot valve plunger in the direction tending to return it to center, resulting in temporary speed droop, and then this force is dissipated slowly by flow through the needle valve. It will be seen that, since all parts acted upon by the flyweight forces or by compensating forces are essentially frictionless, the governor is greatly improved in stability and sensitivity.

At the present time the PG governor is in limited production, but it is expected that in the early part of 1949, it will be in full production and replace the SI.

DIESEL PLEASURE CRAFT



Fifty-foot sport fisherman *Sinqwazi* does over 21 mph. with twin diesel installation developing 400 hp.

THE two boats pictured on these two pages represent the amazing versatility of the diesel engine as a marine power plant. The light weight two cycle engines for a sport fishing cruiser capable of pushing a streamlined hull over 21 mph. and the powerful, heavy duty marine diesel in tug service which can handle two 3500-ton barges at 7 knots. In between these two widely differing installations are thousands of other marine applications where diesel engines have proved themselves.

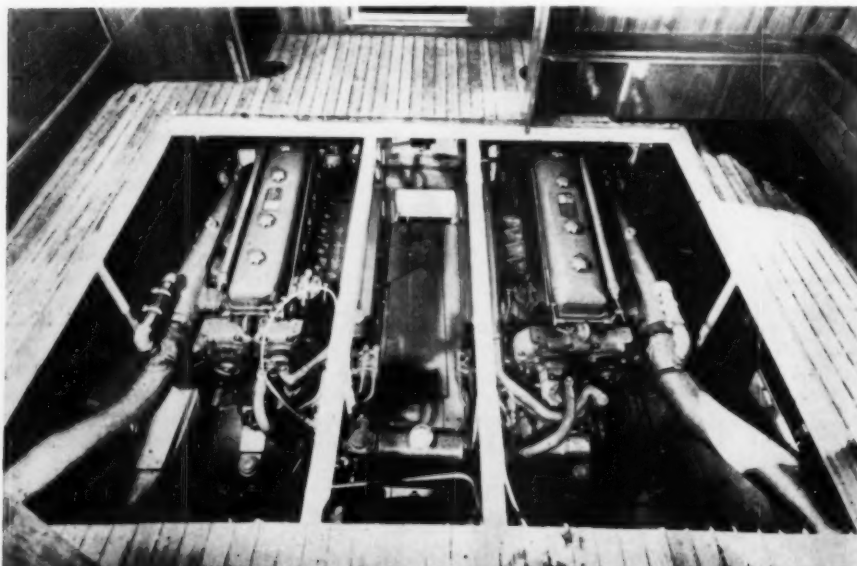
Game fish records around Capetown, South Africa.

will be in for a lot of contesting when the *Sinqwazi*, a 50 ft. diesel sport fisherman, arrives next month. Operation "Overseas," as this invasion by an American built yacht might be called, has been planned both by the owner and the Consolidated Shipbuilding Corporation to embody many innovations directed towards ease of operation and living accommodations. The hull, is a proven Consolidated design (raised deck type) with a lounging salon and a semi-flying bridge associated, yet so divided that the privacy of the owner's party does not conflict with the operating crew.

A general brief description is that the length overall is 50 ft., beam 12 ft and the draft 3 ft. 5 in. The hull is double planked cedar and all superstructures are of solid mahogany, while the decks in the lounging salon and cockpit are teak. There are accommodations for two crew members forward with adequate sanitary facilities. Immediately aft is a large double owner's stateroom, with dresser, lockers, etc. On the port side is a complete toilet room comprising shower, basin, hot and cold running water, and a Groco electric toilet. The galley on the starboard side is fully equipped with a Shipmate gas range and oven, gas hot water heater, hot and cold running water, exhaust blower and a Frigidaire electric ice box. The lounging salon is constructed with complete owner's privacy in mind, having ample locker space with dining facilities included, and additional sleeping accommodations for two or three persons. The cockpit is fitted with two fishing chairs, built-in fish box and portable bait box. The cockpit deck is fitted with extra large scuppers for good drainage.

The vessel is powered with twin G.M. diesels, Series No 71, 200 hp. each, with hydraulic clutches, also $1\frac{1}{2}$ to 1 reduction gears. The engine room equipment consists of 5 kw., 2-cyl., 32 volt Hallett diesel generator, CO₂ Fire Protection system, Eco electric bilge pump, Groco water pressure system, 32 volt Exide batteries, and carries 400 gallons of fuel oil. Goodyear rubber exhausts and Cutless rubber bearings complete the mechanical installation.

Engine hatch of *Sinqwazi* removed showing twin General Motors 6-71 diesel installation.



AND WORK BOATS

THE fastest tug in Robert B. Wathen's fleet is the diesel-engined *Wathen II* which has been in service on the Atlantic coast since its maiden trip of June 18.

Running free, this powerful new vessel is capable of 11.3 knots or 13 statute miles per hour. Prior to final trials it towed one 3500-ton barge at 8.4 knots and two 3500-ton barges at 7 knots. Recently it towed a victory ship from Philadelphia to Wilmington at an average speed of 7.5 knots, according to Robert B. Wathen, of Baltimore.

The *Wathen II*, one of a fleet of six tugs and twenty-four barges owned and operated by the company, is powered by a Cooper-Bessemer 8-cyl., turbocharged, direct reversing marine diesel engine. The *Wathen II* carries an A-1 American Bureau of Shipping classification.

The Cooper-Bessemer engine in the *Wathen II* is rated at 1435 bhp. at 300 rpm. The vessel

measures 140 ft. L.O.A., with a beam of 26 ft. 3 in., depth of 15 ft. and is ballasted to a draft of 15 ft. The *Wathen II* swings a John H. Ferguson & Sons 3-bladed 98-in. by 52-in. wheel at 300 turns.

The *Wathen II* was built by Mr. Robert B. Wathen at his maintenance yard in Baltimore under his personal direction. The steel hull was purchased, obsolete steam equipment removed and the hull rebuilt under the supervision of American Bureau of Shipping surveyors. Upon completion of the new engine bed the engine was set and the engine room fitted out to modern standards. All decks and superstructure were rebuilt and provisions made for crew's quarters and gallery.

The turbocharged engine is equipped with the Cooper-Bessemer patented pressure controlled fuel injection system, precision type main and crank-pin bearings, piston pins bolted to connecting



Engine room of *Wathen II* showing 1435 bhp. 300 rpm. Cooper-Bessemer diesel engine.

rods to provide additional bearing surface, a forged alloy steel crankshaft, full pressure dry base lubricating system and a built-in two-stage water cooled starting air compressor.

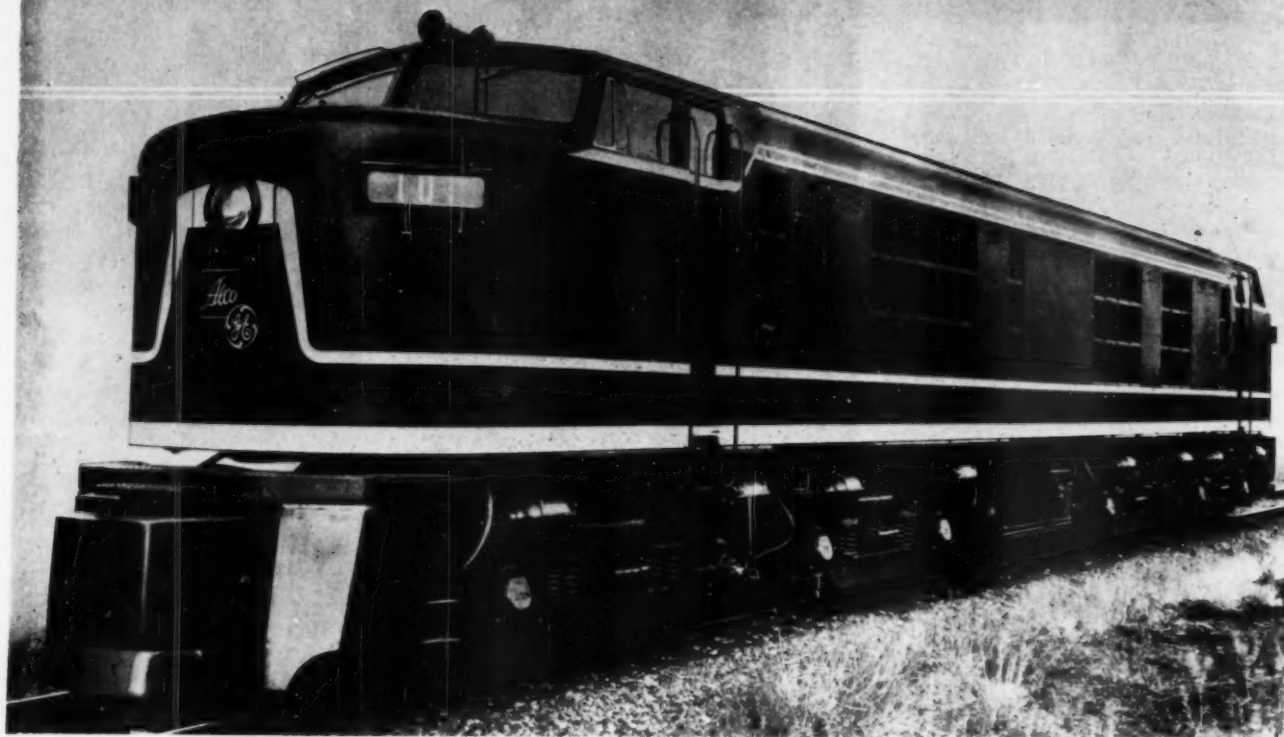
The air starting system includes six 29½ in. by 121½ in. American Bureau of Shipping survey starting air tanks. Fuel tanks are located forward of the engine room and provide a bunker capacity of 30,000 gals. of fuel oil. Other storage includes provision for 1,000 gals. of lubricating oil, 30 tons of fresh water and 150 tons of ballast water.

The *Wathen II*'s best performance was obtained by ballasting the vessel with 125 tons of rock ballast to a draft of 15 ft.

Fastest towboat in Robert B. Wathen's fleet is the new *Wathen II*. She cruises at 11.3 knots and tows at 7 knots.



GAS TURBINE LOCOMOTIVE BEGINS TESTS



Alco-GE 4500 hp. gas turbine locomotive.

THIS spring should see the first American built gas turbine locomotive actually operating on a U. S. railroad.

The American Locomotive Company and the General Electric Company plan to have their jointly-sponsored 4500 hp. gas turbine locomotive in the hands of the Union Pacific Railroad for operational demonstrations by spring. The new unit began its track tests in mid-November at the General Electric plant in Erie, Pa.

Spokesmen for the two companies stressed the developmental status of the new locomotive, pointing out that lengthy factory and road tests must be conducted before any real indication of the ultimate success of gas turbine powered locomotives can be obtained. There are still many factors which are untested.

The locomotive which houses the 19-ft.-long 19,000-lb. turbine unit is 83 ft., 7½ in. long (inside of knuckles). It is 15 ft. 4 5/16 in. high and 10 ft. 7 in. wide. It is of single cab construction with a control station at either end. The total weight is 500,000 lbs., which rests on 4 four-wheel power trucks with a traction motor at each of the eight axles. It has a continuous tractive effort of 68,400 lbs. at 20.4 mph.

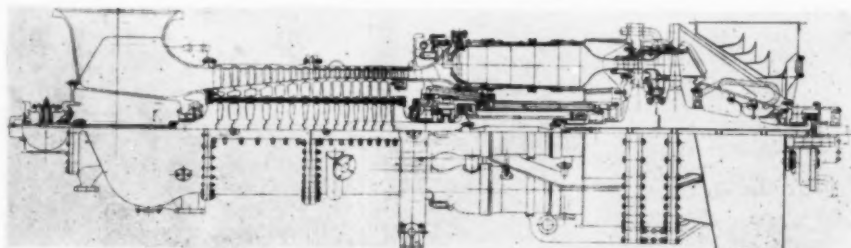
The locomotive is geared for 79 mph., somewhat less than that of present diesel passenger locomotives. It carries enough fuel for a 12 hr. run at full horsepower.

The compressor, combustion chamber and turbine are of inline construction. Air is drawn through a compressor into several combustion chambers. Fuel is injected and the mixture burns, raising the temperature of the compressed air. Resulting gases expand and move at great velocity against the turbine blades, turning the shaft. The shaft drives both the power plant compressor and the generator. The generator supplies power for the eight traction motors.

The turbine is designed to operate on bunker "C" fuel oil. However a great deal of work is being done on the development of a coal burning cycle. Alco-G.E. are cooperating with the Locomotive Development Committee of the Bituminous Coal Research Foundation toward that end.

One of the greatest obstacles in the path of a coal burning turbine is the problem of getting rid of the fly-ash formed during combustion. It is hoped that this research coupled with the experience gained from the operation of this first locomotive design may lead to the development of a successful means of burning coal in a gas turbine locomotive in the near future.

Longitudinal semisection of gas turbine power plant installed in new locomotive.



SOIL CEMENT

PAVING

PROJECT

AS PART of an accelerated movement to improve city streets, the City of Peoria, Illinois has completed its first soil cement paving project with the resurfacing of three blocks on Peoria Ave.

Just two days were required to complete the series of operations in the stabilizing process which offers something comparatively new in the line of low cost cement paving activities. Approximately ten days after the pioneering and semi-finish work was accomplished, the 1.5 inch covering asphaltic coating was applied to give the three block stretch a finished black-top appearance. The procedure was simple.

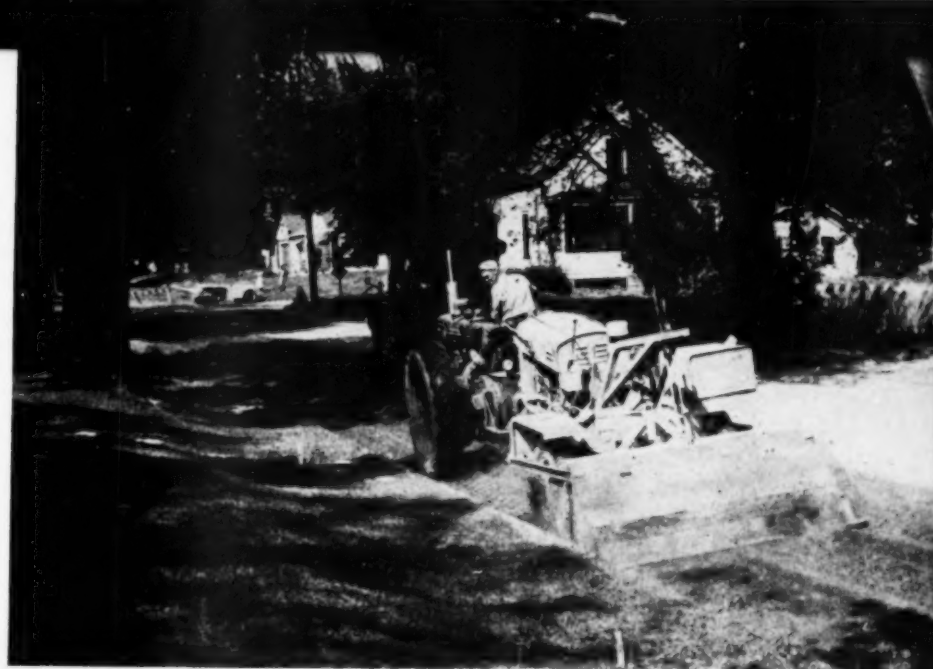
Soil cement paving, which is a thorough mixture of soil and Portland cement tightly packed while in a moist condition, resulted from the intensive search for a low cost method of salvaging the many miles of old gravel and macadam surfaced residential streets which are subjected to a limited amount of travel daily.

Authorities in the new field contend that the soil cement foundation will absorb the weight and pounding upward to 200 commercial cars per day. The figure would increase proportionately with pleasure car usage.

Several important operations are necessary in the soil cement process in order for paving contractors, city officials and property owners to realize their aims for an effective and useful type of reconstruction pavement.

On the Peoria Avenue project, a "Cat" motor grader, equipped with scarifier broke up the old gravel base and bituminous mixture and then a Seaman pulverizer, trailed behind a "Caterpillar" diesel track-type Tractor, pulverized the material and later worked the cement six inches deep into the mixture.

The motor grader shaped the street surface, after which a definite amount of water was thoroughly distributed through the mass. A heavy sheepfoot roller compacted the soil cement compound and a ten-ton steel wheeled roller completed the compaction of the moist material. The street then was shaped to final grade and crown and a six



Cement is drilled six inches into earth to insure proper mixture of earth and cement.

ton pneumatic tired roller with 13 staggered wheels completed the processing.

The smooth cement mixture then was covered with a light coating of bituminous material that served as a tack coat for the heavier asphaltic top and as a sealer so that evaporation would not be so rapid as to cause a chemical reaction within the mixture.

The appearance of soil cement is not greatly different from that of the soil which it contains when the soil is tightly compacted in a moist condition and when dried. The cement element renders a hardened mixture much less susceptible to effects

of moisture than soil itself. Although it does not bear punishment like concrete, the soil cement preparation has lasting quality under limited travel conditions.

Characteristics of the soil being used determines what percentage of cement necessary. Although the normal ratio calls for 2.7 bags of cement per cubic yard of compacted mixture or .45 bags per square yard of six inch compacted depth, a finer texture of soil would demand more cement.

The Peoria Avenue project called for a 9 per cent mixture of cement with the 91 per cent base and water content.

Caterpillar diesel grader, left prepares surface for tractor-drawn sheepfoot roller which packs soil cement mixture.



FIREBOAT FOR PHILADELPHIA

By BRUCE C. SISSON



Unique Diesel Installation Solves Long Standing Power Problem In Firefighting Craft

A VERSATILE and powerful new fireboat, the *Bernard Samuel*, has been added to the roster of 3 such boats now operated by the City of Philadelphia.

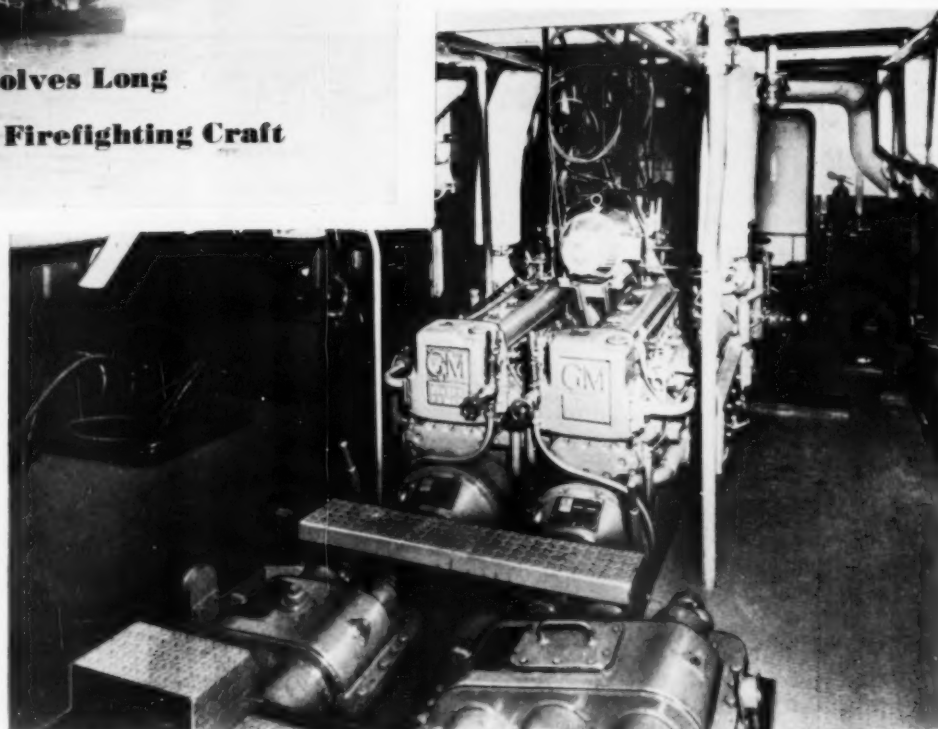
Waterborne fire fighting equipment has always been vital to the safety of the city. This is true also for the docks and the huge refineries, and industrial establishments which spread along the Delaware and Schuylkill rivers in increasing numbers.

When it became apparent that the three existing steam fireboats (all over 25 years old) could not adequately protect this expanding waterfront, city officials consulted with the National Board of Fire Underwriters to determine the proper course of action. The resulting decision called for a small diesel fireboat of about 5000 gpm. capacity. Thomas D. Bowes was called into the picture to prepare plans and supervise construction of a new vessel. Analysis of the harbor conditions showed that the following characteristics should be included in the vessel: First she should have 5000 gpm. @ 150 psi. pumping capacity. She should be small and completely functional, with single screw. She should incorporate simple machinery to reduce capital and operating costs. Ice conditions should be taken into consideration and she should have a reinforced ice breaking hull. Large trim tanks should be incorporated to permit reduction of draft for shallow water operation.

These factors were taken into consideration of the hull design and the fore and aft sections have a definite U shape which permit the vessel to ride up on ice or mud and at the same time permit her to back off again. The longitudinal system of framing was used with flat bars spaced every two feet along the sides and bottom. Athwartship frames are spaced every 4 ft.

The vessel was built by the R. T. C. Shipbuilding Company at its Camden, New Jersey yard. She

(Below) Engine room of *Bernard Samuel* showing Detroit Diesel quad engine which develops 650 hp. Power for pumps is taken from Rockford take-offs and transmitted by De Laval transfer drive (foreground).



is of all welded steel construction 75 ft., 10 in. overall with a beam of 18 ft. Her draft is 7 ft. 6 in. aft and 4 ft. forward. Her dead weight tonnage is 85 tons. Her design is new and she does not have the "converted tug" look that so many of today's older fire boats have.

The arrangement of the piping system was quite a problem on such a small boat. It was complicated by the necessity of having each pump and its valve so connected that in case of damage it could be cut out without affecting the performance of the other pumps. Sea chests are located to port and starboard and are so piped that either one can supply all four pumps.

The pilot house, located forward of the tower is very roomy and commands the various host stations. A ladder from the pilot house leads down into a forward compartment adjoining the engine room which is separated from the forward compartment by a watertight door and bulkhead. The engine room installation is as compact as this writer has ever seen aboard-ship. Considering the job the vessel is required to do, it is amazing. A 660 hp. General Motors quad engine consisting of four 6-71 diesels, drives a single propeller shaft at a 4:1 reduction. The arrangement is such that one, two, three, or all four engines can be applied to the shaft. Four DeLaval 1500 gpm. pumps are mounted offset to the 166 hp. Rockford power take-offs of each engine. DeLaval helical reduction gears transmit power to these pumps from the engines. The engine control panel is located on the port side mounted between the two port engines.

Except for the main engines which have their own heat exchange and generating equipment, there is very little equipment in sight. A 115 volt Bow-

ers battery system is located to port in the after end of the engine room. Forward of that is small 3" x 3 1/2" Gardner Denver air compressor for whistle air which is followed by a one-cylinder, 3 kw. Buda diesel generator which is used for battery charging. The 60 gal. lube oil storage tank is located forward on the port side. A Bowser hand operated transfer pump is mounted on the forward bulkhead. Located forward on the starboard side is an American Standard heating boiler. Then going aft is the manifolding for the high pressure pumps. A ballast pump is mounted aft on the starboard side. The electric control panel is located on the aft bulkhead. Pilot house controls are Adel Isdraulics with master units mounted on either side of the pilot house. The steering equipment is Sperry. Fuel tanks located fore and aft have a total capacity of 2,245 gal.

Trials of the new vessel were held in mid-November and were an occasion for officials of the City of Philadelphia, fire insurance underwriters, representatives of the American Bureau of Shipping, and shipyard officials to come aboard to check on the *Samuel's* performance. There were about thirty persons aboard including the crew when the new boat backed out of her berth at the R. T. C. yard. After clearing the pier, the vessel, with all four diesels on propulsion, each one turning its rated 1850 rpm., virtually leaped ahead. It was the same sensation as one has in a light power boat when the throttle is opened wide. Once in midstream the anchor was dropped and a test strain taken. After this ground tackle check, the pumps were turned on and all nozzles were given pressure. These included the three mechanically operated monitors, one forward and one aft, and the tower monitor plus six gunwale mounted nozzles. With all four engines on the pumps a capacity of 5,875 gpm. was reached, quite a bit of water for a small boat to handle.

The hose utilized aboard the vessel is 2 1/2 in. duck which is tested at 400 psi. The pressure aboard the *Samuel* never goes above 150 psi. and even this pressure can be very dangerous when a hose

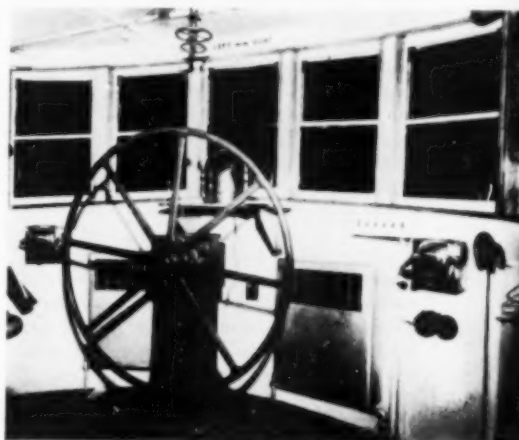
goes wild. For that reason all nozzles are secured in gunwale mountings which permit a wide arc both horizontally and vertically.

Following tests with varying engine combinations with the pumps, skipper H. T. Artis of the Philadelphia Fire Department turned the vessel down river for the Tinnicum range for speed trials. On the way down the two police boats following had quite a time keeping up with her. For the speed trials the engines were held at 1850 rpm. The Tinnicum range course was run in both directions at slack high water to equalize current and tidal effects. Her speed was better than 17 knots. There then followed turns to starboard and port at full speed. These were accomplished with the tower raised with only a 5° list.

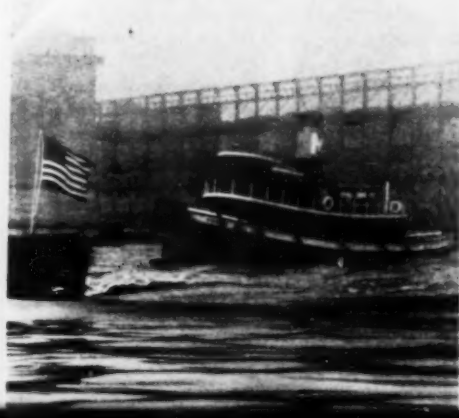
The last test was Emergency Astern, the jarring one from full ahead to full astern. The ship came through this final test with flying colors in 7 seconds and the broom was hoisted to the top of the tower signifying a clean sweep.

Veteran fire boat men were more than pleased with the results of the trial trip aboard the *Bernard Samuel*. She represents something new in fire boats and more of her type will be built. The new boat will be utilized to cover the upper reaches of the harbor.

Pilot house view showing Adel controls flanking Sperry steering stand.



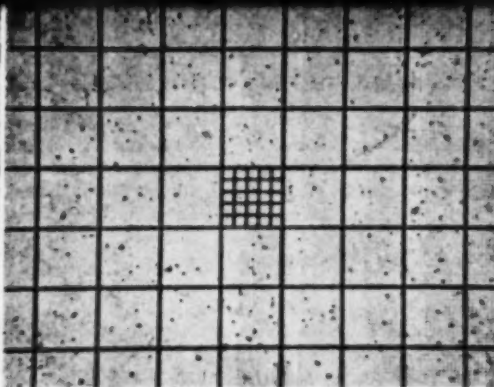
Officials at the acceptance trials were: (left to right) Edward Gould Brownlee, Vice-President R. T. C. Shipbuilding Corp. Howard McBride—Police Inspector, Dept. of Public Safety, City of Phila. John P. Cerson, President R. T. C. Shipbuilding Corp. Thomas D. Bowes, Naval Architect, designer of the vessel. John Cost—Chief Engineer—Dept. of Public Safety Bureau. Harry Artis—Pilot, Captain of vessel.



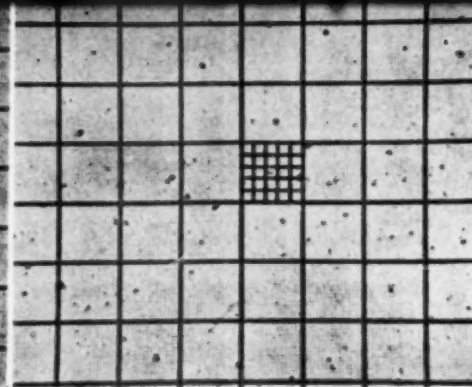
Bernard Samuel underway with 3 monitors in action.



Initial mixture of Air Cleaner dust and varsol before filtration. Magnification is 300.



After first pass through filter, only particles under 5 microns seen. (Small squares are 4.5 microns wide).



After pressure drop of 6 inches of mercury across filter even fewer particles are seen in slide.

LET'S TALK ABOUT MICRONS

By BRUCE C. SISSON

TWENTY-FIVE thousand one-micron particles if laid end to end would just about cover one inch of a lab technician's ground glass slide. That is how small a micron is! At first glance one would suppose that only laboratories and research centers should have anything to do with these infinitesimal particles. This was the case for a very long period until engine manufacturers and, still more, their customers found that the lowly micron was something not to be scorned. As diesel engine tolerances became finer, when rotational speeds and bearing loads became higher it was found that something more than a basket strainer was needed for fuel and lube lines. Strainers were all right for removing bolts and nuts and old cleaning rags but they did nothing to stop the passage of the smaller even more dangerous dirt particles which could lodge in injection pumps and bearings and cause scoring and wear.

It has only been a few years now that filter manufacturers have turned to this new concept of filtration. It has been proved beyond all doubt by leading research institutions that abrasive particles five or more microns in size will create excessive wear between moving surfaces.

The developmental work carried on by individual manufacturers in this field has been described in DIESEL PROGRESS over the past months. Here we will discuss the developments made by Purolator Products, Inc.

This month under the sponsorship of the Diesel Engine Manufacturers Association, a group of

university professors will visit the Purolator plant and go through the extensive laboratories and plant facilities with the idea of learning some of the facts of life concerning the manufacture of filters. Several of these educational conferences have been held around the country and have proved eminently successful. This one should prove no exception.

Purolator Products, Inc. was organized in 1923 under the name of Motor Improvements, Inc. and immediately began the development and manufacture of an automotive type filter. In 1924, the then new Chrysler car appeared with the Model A Purolator filter installed. The company rapidly expanded into the motor truck and farm equipment field, scoring notable successes in the tractor field. These moves were followed by Purolators entrance into diesel engine fuel and lube filtration. Along with this rapid development was the building up of a large replacement market.

Purolator was in an excellent position at the outbreak of World War II to supply the Government with filtration equipment for many hundreds of different types of equipment.

The development of micronic filtering media just previous to the war aided considerably in solving some of the difficult filtration problems posed by radically new equipment. More than once high priority was given Purolator material demands in order that urgently needed equipment could be supplied the armed forces.

It was in 1938 that work began on micronic filtration. Extensive research and testing led to development of a special resin-impregnated filter paper, the density of which could be controlled accurately. This media adapted to the radial fin type of filter construction showed excellent efficiency. It showed high resistance to acid action, high temperatures and pressures.

As for the removal of micronic particles by this filter one has only to turn to some of the test reports made by the company for the government. These tests were made with U. S. Standardized

Air Cleaner Test Dust which contains graded dust ranging from one micron on up. On the first pass through the filter, 97.81% of all dust was removed. After a pressure differential of 3 in. of mercury was reached across the filter, samples showed that 99.99% of the dust had been removed. All but 2.3% of the particles larger than 5 microns were trapped by the filter on the first pass. The third test sample showed that only .7 of 1 per cent of the particles over 5 microns were left in the system. This performance was well above the government specification requirement of 93% particle removal.

While it is recognized that micronic filtration is more and more becoming a necessity for diesel operation other methods of filtration are still very important. The metal edge-type filter is generally used in conjunction with micronic elements. Purolator developed this type of filter early in the game. It consists of a metallic ribbon of bronze or other metal which is wound edgewise on a cylindrical perforated frame. This ribbon has a flat front edge and tapers in cross section. It is provided at definite intervals with projections of uniform height which support the front edge of the ribbon parallel to the frame on which it is wound. The height of these projections determines the degree of filtration achieved. This construction provides edge filtration that will shear solid particles from the oil. Because of the tapered cross section of the ribbon, it is impossible for wedging of solids to take place behind the front edges. These metal elements are supplied with attached cleaning blades which permit cleaning of element while filtering is going on. This type of filtration will stop particles as small as .001 in. according to the height of the spacing projections.

The use of filters in combination is very common especially for fuel and lubricating oil use. The edge type filter will remove the larger particles while the micronic element removes the smaller contaminants. Purolator also utilizes fabric elements of the extended area type. These were the prototypes of the present radial type paper element but had an advantage that they were cleanable, whereas the paper elements are not. How-

Section of Purolator edge-type filtering element.





View of Purolator testing laboratory.

ever the efficiency of the micronic paper element plus the ease and relatively low cost for replacement made it more popular.

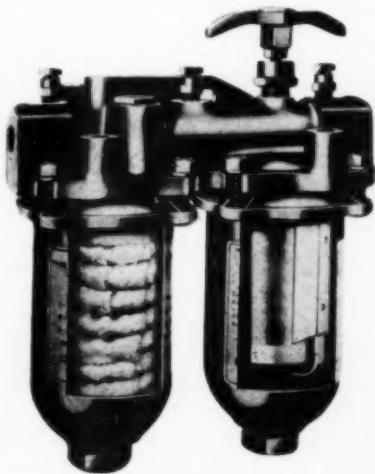
The Purolator two-stage single unit types combine and outer fabric element a second stage metal element. The metal element prevents the passage of any woolen fibres being passed into the oil stream. Another type of duplex model combines a first stage metal type filter with cleaner blade and a second stage filter consisting of the fabric element and another metal edge filter. Duplex edge type filters are available for oil flow as high as 150 gpm. Simplex types with by-pass and relief valves will handle 500 gpm. The micronic type filters are also offered in duplex arrangement for fuel service with flow rates up to 720 gph. Flow rates for lube oil are lower.

Purolator maintains extensive research and development facilities in their Newark plant. J. P. Kovacs Purolator's chief engineer is constantly faced with new installation and development prob-

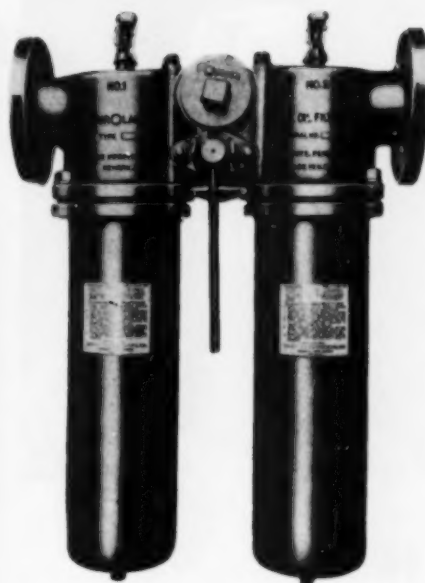
lems. Something like 650 separate projects have been completed during the past year. Of necessity this requires a large staff of trained engineers, draftsmen and technicians. Filter manufacture requires great versatility and ingenuity. Practically every installation requires a new approach. No two are alike. That is why manufacturers like Purolator try to have their equipment adopted as factory furnished equipment.

Close cooperation between chief engineer Kovacs and his assistants, Assistant Chief Engineer R. D. Barry, chief designer Herbert Hultgren, Ronald Burla, chief test engineer and A. G. Pogmore, service manager, make for a smooth operation. The laboratory is equipped to design, build, and test any type of filter. A special microscopic laboratory furnished with the newest equipment enables Purolator to check the efficiency of their filter elements right down to the last micron. A system of quality control has been in effect for some years now and has proved extremely valuable in maintaining a rigid production standard.

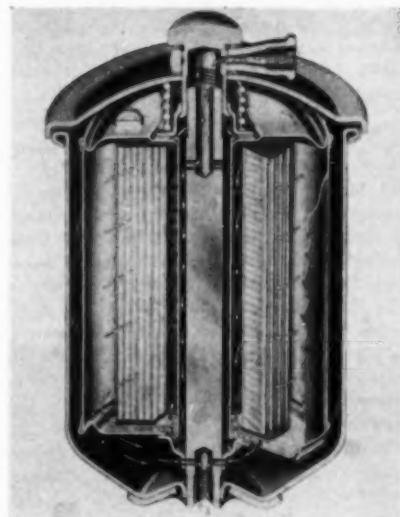
(Left) Purolator 3-stage filter for fuel oil combines cloth and edge type filtration.



JANUARY 1949

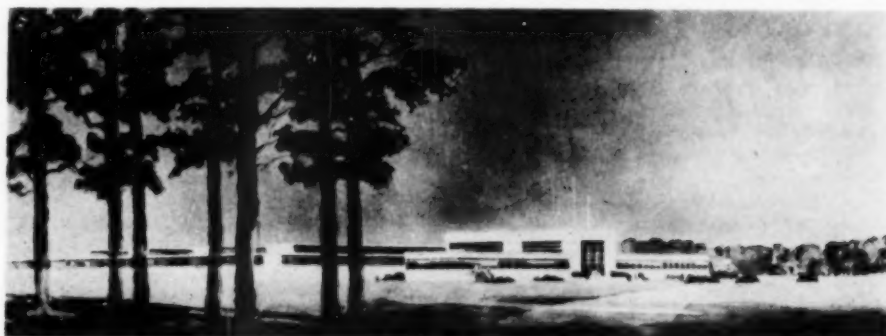


Purolator lube oil filter—edge type.



Cutaway view of radial fin type micronic filter showing construction and direction of flow.

Architect's drawing of new Purolator Plant to be built this year.





R. H. Morse, Jr.

ROBERT H. MORSE, JR., Vice President in charge of all operations, Fairbanks, Morse & Co., was elected president and treasurer of the Diesel Engine Manufacturers Association at the Association's annual meeting, held in Chicago, Dec. 8. Elected as vice presidents were A. W. McKinney, Executive Vice President of National Supply Co., and O. H. Fischer, President of The Union Diesel Engine Co.

Directors elected were George W. Codrington, Vice President of General Motors Corp. and General Manager of Cleveland Diesel Engine Division; Perry T. Egbert, Vice President in charge of diesel and locomotive sales, American Locomotive Co.; Robert E. Friend, President of Nordberg Mfg. Co.; Gordon Lefebvre, President of The Cooper-Bessemer Corp.; Walter A. Rentschler, Vice President of Lima-Hamilton Corp.; E. J. Schwanhauser, Vice President in charge of sales, Worthington Pump & Machinery Corp.; Marvin W. Smith, Executive Vice President of The Baldwin Locomotive Works; Mr. Morse, Mr. McKinney and Mr. Fischer. Harvey T. Hill was reappointed Executive Director of D.E.M.A., and enters upon his fifth year of service at that post. The annual meeting was the most interesting, constructive and forward-looking that the Association has ever held.

A trend that has developed in recent months in the diesel engine industry prompted D.E.M.A. to invite the representatives of the Bituminous Coal Research, Inc., and of the Battelle Memorial Institute, to be its guests at luncheon on Dec. 8. The trend has sprung from an increasing use of dual-fuel engines, which can burn both oil and gas fuel. The coal industry officials were told that the diesel industry, having developed the dual-fuel engine, wanted assurance that gas would be available wherever the engines were located. The diesel industry also was keenly interested in the quality of gas to be had, in what quantity, and how much it would cost.

J. B. Morrow, President of Bituminous Coal Research, Inc., opened the speaking session following the luncheon, by giving the background

D.E.M.A. Holds Annual Meeting



Elects R. H. Morse Jr., President. Delves Into Fuel Sources For Dual Fuel Engines, Hears Dr. John T. Rettaliata On Future Of Gas Turbine as Prime Mover.

of BCR and its activities. Dr. Harold J. Rose, Vice President of BCR and director of its research program, said the program was one of the largest in the country from a standpoint of dollars expended. BCR does not operate its own laboratories. Mr. Rose explained, but places research projects in colleges and universities. Battelle Memorial Institute has BCR's biggest single group of projects. Battelle would be interested in co-operating on a research program, Mr. Rose said, concerned with the development of gas producers for dual-fuel engines of 200 hp. and over.

Ralph Sherman, Assistant Director of Battelle, said it had under way an extensive program on gasification of coal, believing gasification was the most economical way to use the nation's coal resources. John Mitchell, Chairman of BCR's gasification committee and director of research for Eastern Gas Associates, pointed to the need for a good gas-producing unit.

That need was emphasized by Carl E. Miller, Battelle's technical advisor, who stated that present-day producers were too big—they must be smaller, portable and less costly. Also, they must produce clean gas and be "reasonably automatic and fool-proof insofar as the operator is concerned," said Mr. Miller. He added that Battelle has \$37,000 with which to conduct development work on a gas producer during 1949, but that a project of this nature usually required five years and indicated that a larger fund would be needed.

Definite action resulted from the discussion when it was decided to form a joint committee to work toward an adequate supply of gas for dual-fuel engines. The committee will be drawn from the personnel of the diesel industry and of Battelle Memorial Institute. The committee's objective will be two-fold: to study possible developments on the part of companies already making producer equipment, and to study the possibilities of concentrated research of coal companies and various other industries interested in this kind of equipment.

Engineers of the Diesel Engine Manufacturers

Association had a busy time of it, assembling a day ahead of D.E.M.A.'s annual meeting and being in continuous session that day, that evening, and throughout the following day.

They convened the morning of Dec. 7 with a discussion of hiring and training young engineers under the chairmanship of Gordon Anderson, Director of Engineering for Fairbanks, Morse & Co. Following this George Steven, Executive Engineer of Worthington Pump & Machinery Corp., led a discussion on the development and future of dual-fuel engines and the advisability of supplementing the Association's book "Standard Practices" with information on this type of prime mover.

At the noon lunch hour, the D.E.M.A. engineers were hosts to 10 chief engineers of the filter manufacturers who are cooperating in D.E.M.A.'s five-year educational project. A symposium was held on "Filters and Filtering" which lasted until mid-afternoon. Much of it took the form of a spirited discussion between filtering engineers and diesel engineers, during which all agreed that a set of standards for filters should be established.

There followed reports on D.E.M.A.'s educational program by Ervin L. Dahlund, the Association's newly appointed director of education. He gave the following as the six objectives of the program: (1) Well equipped laboratories for mechanical engineering schools, (2) planned use of this equipment, (3) improved texts, (4) better courses, (5) additional subjects for theses, and (6) the helping of professors to help themselves, through practical contacts in the industry.

That evening the D.E.M.A. engineers, and engineers from the filter manufacturers, sat down at a dinner with Association officials who had already arrived on the scene. Guest speaker was Dr. John T. Rettaliata, Dean of the School of Engineering, Illinois Institute of Technology, whose topic was "The Present and Future Status of the Gas Turbine."

Following his introduction by Knute O. Keel, Chief Engineer of Cleveland Diesel Engine Division, General Motors Corporation, Dr. Rettaliata said there are now 53 turbine units in the country producing 276,500 kw. The turbine locomotive was still in the future, Dr. Rettaliata said, and would likely not be in operation until 1950.

"I don't want to tell you that all our problems have been solved, because they haven't," he said. "And I don't think the turbine is going to put the diesel engine out of business."

Beginning the second day of their session the morning of Dec. 8, the engineers discussed revisions that could be made in "Marine Diesel Standard Practices" if a third edition of the book is printed. John G. Earle, special representative of Nordberg Mfg. Co., presided.

T. M. Robie, Manager of general diesel sales for Fairbanks, Morse led a discussion on "What Future Standards Should D.E.M.A. Develop?" The engineers considered editorial revisions in existent books of standards.

Towing Records Set By Diesel Tugs

BY USING diesel-electric tugs for hauling barges from the United States to Venezuela, the Moran Towing & Transportation Company has established something of a record by covering 41,000 nautical miles in five months.

Operating with the regularity of a routine New York harbor schedule, the company has been towing new floating equipment in connection with the Creole Petroleum Corporation's exploration and production program on Lake Maracaibo.

The area of the Creole operation extends for 50 miles along the north-eastern shore and out into the lake for ten miles. More than 1,500 towing derricks are at work there. Gathering stations, absorption and compressor plants, as well as the derricks, have been built over water on pre-cast, monolithic-type concrete piling which sometimes reaches a depth of 185 feet, extending down to and below the lake bed. Paralleling the shore are piers, terminals, shops, foundries, cement works, shipyards and other facilities.

Six Moran tugs operating principally between New Orleans and Maracaibo from the latter part of March to the latter part of August 1948, set up the 41,000 nautical mile towing record which is the equivalent of twelve and a half trips across

the North Atlantic from New York to Southampton. Of the six Moran tugs used, five were General Motors Cleveland Diesel-electrics of 1,900 or 1,200 h.p. Shuttling back and forth between 30 and 10.5 degrees north latitude, the "M" tugs delivered in the five month period 33 steel barges ranging in length from 65 to 174 feet, with maximum widths of 70 feet and depths up to 12 feet. The operation is still going strong.

The Creole Petroleum Corporation has built up and currently maintains a huge fleet of special marine equipment for the construction of foundations, drilling platforms and derricks, laying marine pipelines for gathering oil, and for miscellaneous requirements in connection with its extensive program. There are test, drilling and construction barges, motor-driven conveyors, mixing hoppers, pumps and manifolds compressor barges and pile drivers as well as speed boats, tugs, launches and other types of passenger and service craft in service.

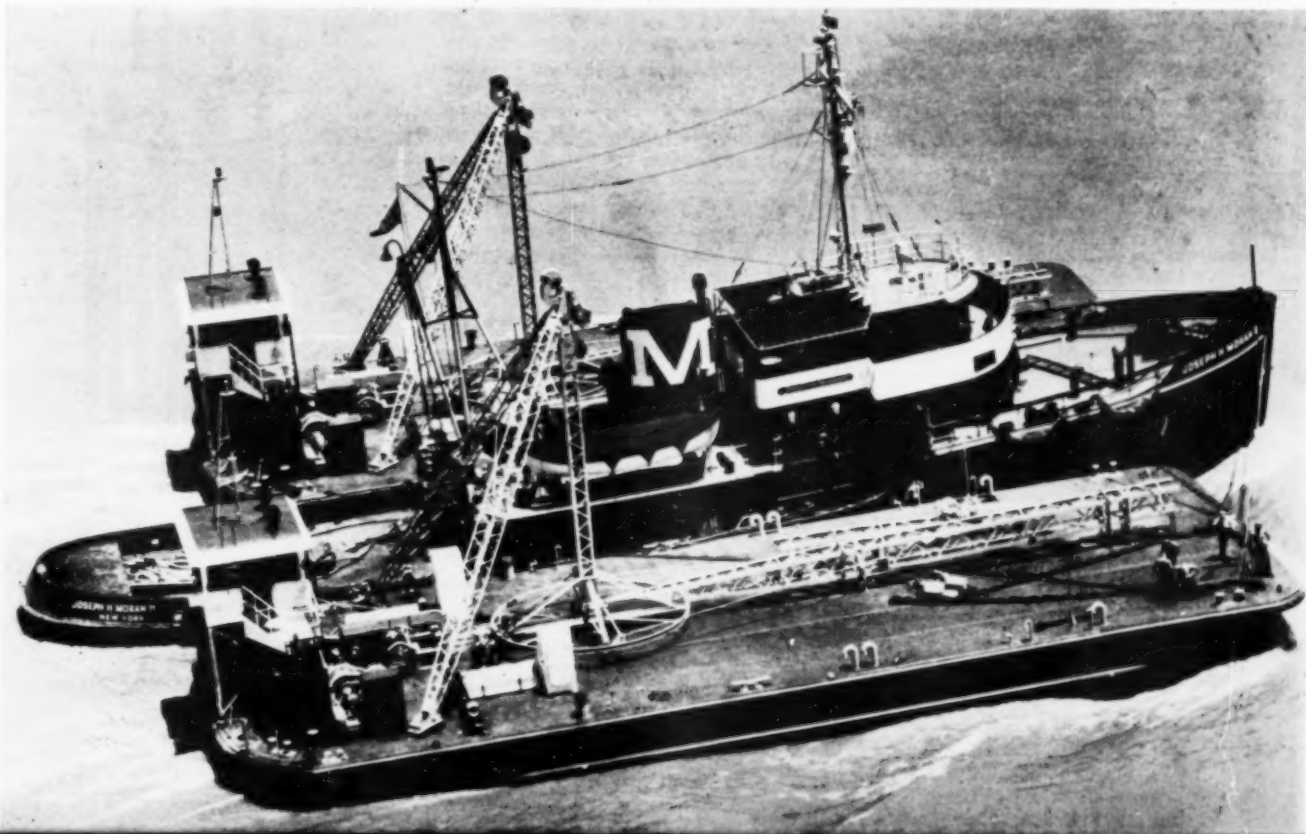
There are, for example, six self-propelled derrick barges, 85 and 110 feet long; one 174 foot drill boat; three lighters 65 and 85 feet long two of them self-propelled; one 110 foot hopper barge, and 22 ordinary barges ranging from 65 to 78 feet in length.

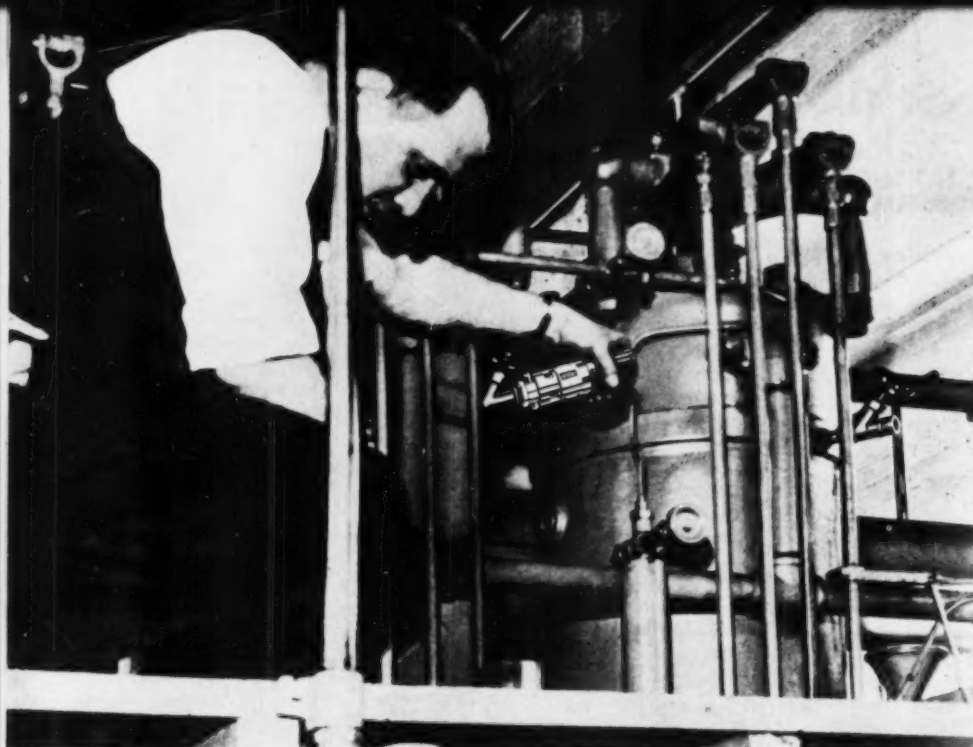
The Creole corporation has found that the flexibility and reliability of Diesel-electric propulsion power is particularly adaptable to these long oil-industry hauls. In fact, the performances were so excellent that when the Moran directors recently decided to order five new tugs of exceptional power, there was no hesitation. Preference was given to Diesel-electric and the order for the machinery for all five tugs was placed with General Motors Cleveland Division.

There have been two principal routes taken by the Moran tugs on their barge tows: 1, Across the Gulf of Mexico, through the Yucatan Channel, then south to Cuba, between Jamaica and Haiti, and then across the Caribbean Sea; and 2, Across the Gulf of Mexico through the Straits of Florida, along the north coast of Cuba via Nicholas and Old Bahama Channels, through the Windward Passage and across the Caribbean. One slightly off-track voyage was made by the tug "Eugenia M. Moran" which went to Amuay Bay and then to La Guiría.

On the return trips from Venezuelan waters, the Moran tugs, because they were running light, have been following a course which lops something like 1,200 miles off the total for the voyage back to New Orleans.

The Joseph H. Moran II, one of the fleet of General Motors Cleveland diesel-electrics which has covered 41,000 nautical miles in five months towing barges from New Orleans to Lake Maracaibo, Venezuela. The Moran Towing and Transportation Company has delivered 33 huge barges to the Creole Petroleum Corporation project.





Checking firing pressures of large stationary diesel with Bacharach Premax Indicator.

THE inherent efficiency of the diesel cycle which every designer of a diesel engine takes full advantage of in setting up the operating characteristics of his engine, is nevertheless a function of the compression and firing pressures experienced in the engine throughout its operating life. Therefore modern routine engine maintenance should include regular and frequent check-up of these pressures and every diesel engine operator should have the necessary equipment to make these tests.

Cylinder pressure check-up reveals most of the defects as well as the virtues affecting the efficiency dependability—even the overall life of a diesel engine. This test shows up both proper and improper fuel injector action, free or clogged intake air filters and silencers, defective valves and valve timing, sticking or broken piston rings, excessive bearing clearances, improper cooling, leaking gaskets and other operating conditions. Some of the manifestations of these defects are loss of power, sluggish acceleration, smoky exhaust, balky starting, high fuel rate, overheating and fluctuating output.

Since detection is the first step toward correction, none of the above conditions need be tolerated longer than it takes to apply an engine pressure indicator, make the diagnosis from the pressure readings and then take the corrective steps. Most engine ills—like the stitch in time—are more easily corrected if caught in the early stages.

Having given the engine manufacturer's recommended compression and firing pressures, the pressure indicator will quickly show whether or

not these pressures are normal. The instrument is easily attachable to any diesel engine. The instrument should be a part of every diesel engine maintenance kit and its use should be a required step in every routine check-up.

Here is what regular check-up with a pressure indicator did for one plant where there are two 220 hp. diesels and one 180 hp. diesel. The plant operates 24 hours every day. Pressure readings are taken on each cylinder every month to ascertain that compression pressures are within 15 psi. of the manufacturer's recommended pressure and that firing pressures do not vary more than 50 psi. with the engine operating at constant load and speed. This procedure revealed abnormal conditions in one engine, which when corrected increased the engine output 14% and reduced fuel consumption 10%.

Another plant operating one 800 hp., and four 1000 hp. diesels, was averaging 11.66 kw.-hrs. per gallon of fuel before acquiring a pressure indicator. After instituting the regular check-up of cylinder pressures and correcting the conditions so indicated, the average fuel consumption of this plant was reduced to 12.66 kw.-hr. per gallon—a saving of exactly 1 kw.-hr. per gallon of fuel. This represents in this plant, an increase in output of 750,000 kw.-hrs. per year which means, with total power cost at 1¢ per kw.-hr. at the switchboard, a saving of \$7,500 per year. We don't know exactly, but we doubt that the pressure indicator cost as much as 2% of that saving.

Every case under investigation where the pres-

MAINTAINING DIESEL ENGINE EFFICIENCY

By GEORGE D. CROSSLEY



View of new Premax Indicator which features patented ball piston action.

sure indicator is used regularly has shown either a direct saving or the aversion of serious operating failures or both. The manufacturers of pressure indicators do not offer them as a cure-all or tell-all but long experience has proved them to be among the "musts" in diesel engine maintenance and operating instrumentation.

WHALE FACTORY SHIP

By DWIGHT ROBISON

THE whale factory vessel *Thorshovdi* is one of the most modern whale factory ships in the world. With it the Norwegian whaling fleet has regained its pre-war strength. During the war, the Thor Dahl interests lost two of their floating whale factories, and the *Thorshovdi* and *Thorshavet*, the latter of which was completed last year by Harland and Wolff, have made up for these losses.

She is 638 ft. overall, with a length between perpendiculars of 600 ft. making her one of the longest vessels ever built in Denmark. Her beam is 77 ft., 4 in. Her deadweight tonnage is approximately 23,250 tons. Her gross register tonnage is about 18,360. Cargo tank capacity is 1,080,000 cu. ft. Her speed on her trial run was 12.5 knots.

The vessel, which has a flensing deck, poop and a long forecabin as well as an upper forecabin is otherwise arranged as a tanker with 11 main tanks, two pump rooms and fuel oil tanks.

The whales are hauled up the slipway at the stern to the flensing deck. The hauling equipment includes two 40-ton steam winches placed on top of the winches house, one 15-ton steam winch placed at the after end of the lower forecabin deck and, furthermore, two steam winches placed on top of the casing aft. On the flensing deck are fitted four bone saws and steam capstans which, together with the electric cargo winches,

are handling the cutting up of the whales. The cut-up portions are distributed through orifices to the factory boilers below.

The factory plant consists of twenty Kvaerner rotating units, twenty whale oil settling tanks, two glue-water plants with vibrating screens.

It being possible to employ the vessel as a tanker outside the whaling season, the factory has been equipped with mechanical ventilation, which is very effective. The ship's complement, including that of the whalers, numbers about 400.

The ventilation and heating of the entire vessel is carried out by means of steam-heated air which is forced by powerful blowers through ducts to all compartments. The air temperature is automatically regulated by thermostats placed throughout the accommodation.

The ship is equipped with the best navigation instruments, such as radar, S.A.L. log, gyro compass, etc., comprising a radio installation, short and long wave, enabling the vessel to be in constant communication with the owners in Norway. Two Burmeister & Wain direct reversible, single-acting, two-stroke, 6-cylinder cross head engines with airless injection supply main propulsion power. Cylinder diameter is 24.4 in., stroke is 45.4 in. Total normal output is 7,400 ihp corresponding to about 6,000 bhp. at 125 rpm.



Stern view of *Thorshovdi* showing whale hauling chute.

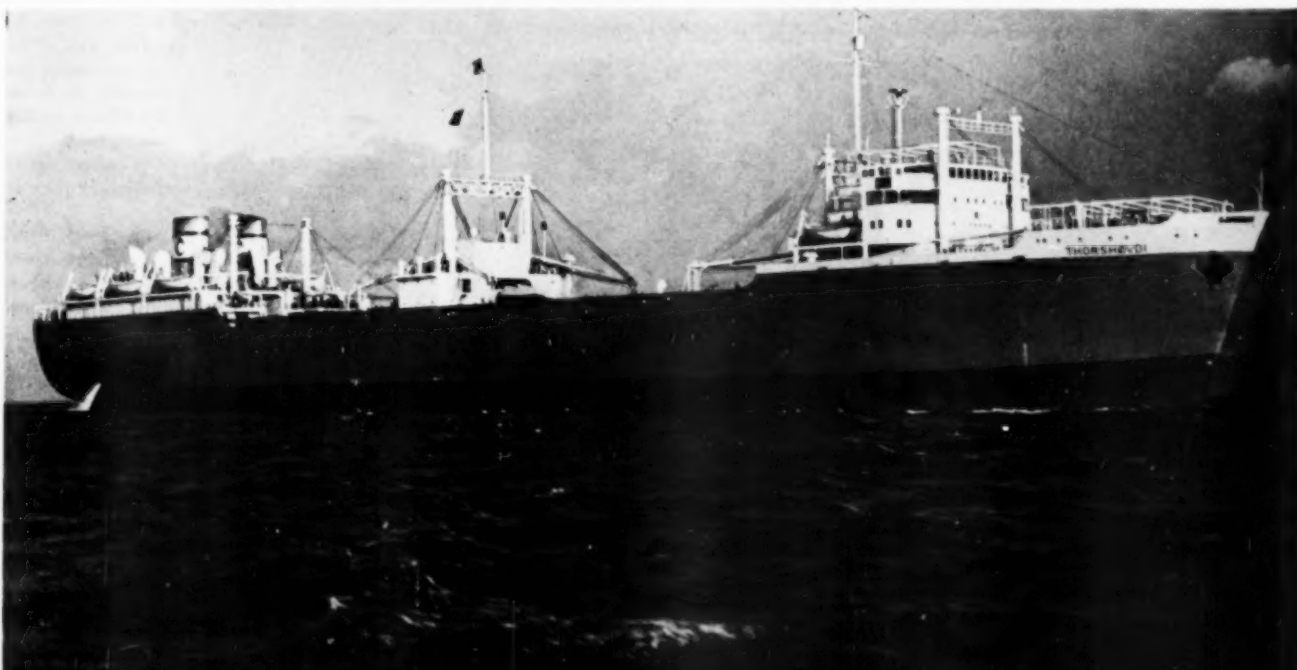
In the engine room are three 4-cylinder B&W four-stroke auxiliary engines with airless injection, each direct coupled to a generator of 133 kw. at 220 volts and 425 rpm. The diesel cylinders have a diameter of 9.7 in. and a stroke of 15.7. The output per engine is 200 bhp.

In a separate room on the factory deck are furthermore installed for the use of the whaling factory three 8-cylinder B&W two-stroke auxiliary engines with airless injection, each direct coupled to a generator of 533 kw. at 220 volts and 300 revolutions per minute. The diesel cylinders have a diameter of 11 in. and a stroke of 19.7. The output per engine is 800 bhp.

All large pumps for the main engine are vertical pumps, each direct coupled to an electromotor by resilient coupling.

Starting air for the diesel engines is supplied by two electrically driven manoeuvring air compressors, each having a capacity of 4 cu. m.

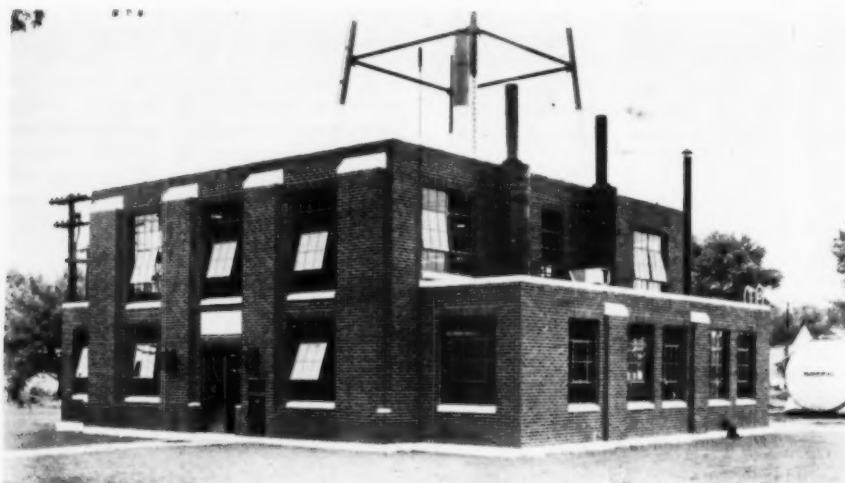
Thorshovdi, 23,250-deadweight tons develops 6000 bhp with two Burmeister and Wain diesels for 12.5 knot speed.



LA PLATA, MISSOURI

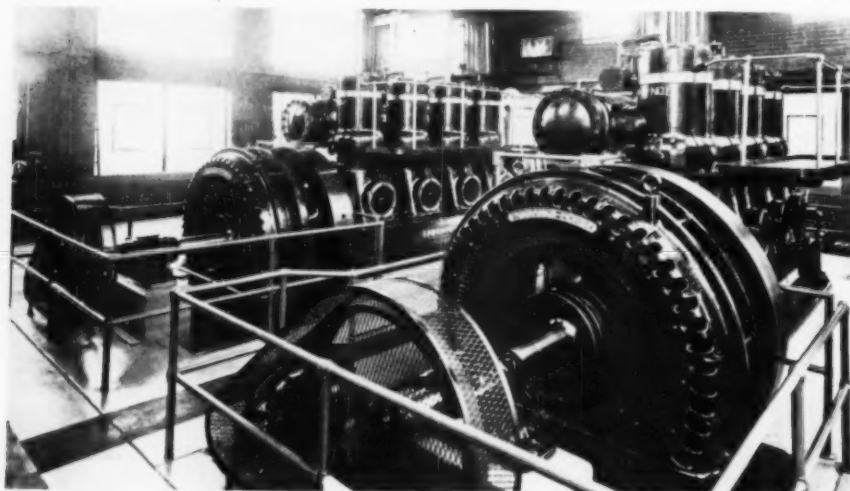
By A. V. REITER

| | 1942 | 1943 | 1944 | 1945 | 1946 | 1947 |
|-----------------------------|---------|---------|---------|---------|---------|-----------|
| January | 57,800 | 58,600 | 62,200 | 69,300 | 87,500 | 91,300 |
| February | 50,900 | 50,400 | 59,000 | 63,000 | 76,700 | 85,400 |
| March | 51,500 | 55,400 | 64,300 | 69,400 | 80,400 | 94,300 |
| April | 46,500 | 50,900 | 61,200 | 66,200 | 73,700 | 90,800 |
| May | 46,700 | 53,000 | 56,100 | 67,600 | 76,900 | 90,600 |
| June | 46,600 | 52,800 | 52,300 | 60,100 | 69,000 | 80,300 |
| July | 50,400 | 53,800 | 54,100 | 61,200 | 71,800 | 80,600 |
| August | 51,500 | 54,900 | 55,000 | 60,500 | 81,000 | 94,200 |
| September | 52,000 | 50,400 | 53,800 | 64,200 | 72,000 | 91,400 |
| October | 54,100 | 54,700 | 57,500 | 69,300 | 80,400 | 100,100 |
| November | 53,700 | 58,100 | 66,100 | 72,800 | 82,900 | 111,800 |
| December | 59,500 | 62,200 | 69,400 | 54,500 | 91,600 | 123,100 |
| Total | 611,300 | 655,200 | 711,000 | 778,100 | 947,600 | 1,143,900 |
| Increase over previous year | | 43,900 | 55,800 | 67,100 | 169,500 | 196,300 |
| Percent increase | | 7.2% | 8.5% | 9.4% | 21.7% | 20.7% |



View of Municipal Light and Power Plant at La Plata. The exhaust silencers are Maxim.

View of two original Fairbanks, Morse 300 hp, 300 rpm diesels installed in 1938. Another engine was installed in 1947.



THE idea that it takes a sizeable community bolstered with special industrial loads to make a municipally owned light and power plant a profitable concern, has been often disproved. A typical case is that of LaPlata, Missouri.

This pleasant town of 1500 population, tucked up along the border of Macon County in northeastern Missouri where farming, dairying and poultry raising are the chief vocations, has a completely modern power and light system. Since it began operation November 21, 1938 with two Fairbanks-Morse & Co., diesel generating units, each rated 300 hp. at 300 rpm., it has served with a steadily mounting output of electrical energy at reduced rates, consistently retired the bonds on its purchase out of its surplus earnings, contributed substantial financial aid to several important civic improvements, and in June of 1947 installed its third Fairbanks-Morse diesel generating unit.

This is showing excellent returns on the original cost of \$98,000, of which all payments on the direct obligation bonds are being met by power and light earnings.

As the plant's prosperity increased, during the calendar year of 1945, it was able to show a net profit of \$9,837.85 after all operating costs were paid. By July 1946 the plant earnings, in addition to retiring the bonds on schedule, had accumulated a surplus of \$37,750 and saved the city \$25,000 formerly raised by taxes. The year of 1947 surpassed the \$30,683.56 of total collections with the figure of \$34,825.83.

An immediate benefit with the induction of the municipal plant was reduction of residential, stove and commercial rates, and free power for all city street lights and the white way. Previously the bill for municipal street lighting and been \$160 a month. Water pumping which had cost the city \$200 a month was reduced to \$80. Annually this amounts to a sizeable saving, permitting the city's general fund an opportunity to spend on other municipal necessities.

It is interesting to note that after the war, the increase annually of kw's generated, has been over twenty percent. Table A shows that in the past six years the annual kw. output has practically doubled.

The three 300 hp. Model 32E14 Fairbanks-Morse & Co. diesel generating sets are equipped with the following auxiliaries: Woodward governors, Zenith fuel oil strainers, Purolator lube oil filters, Renuoil Lube Oil Reclaimer built by Diesel Service Company, Burgess air intake filters, Maxim exhaust silencers, Alnor pyrometers, Ross heat exchangers, and Crane Company valves.



Washington Iron Works Yard, owned by Western Logging Company, Valdez, Ore., powered by a GM Series 71 "Twin." Ed Morley, one of the owners of the firm, reports: "We have used this unit in some of the toughest locations in our entire operation and we're well pleased with its performance."



This Skagit Yard, owned by Johnston Logging Co., Medford, Ore., powered by a 4-cylinder GM Series 71 Diesel engine, handles up to 100,000 board feet of timber per day. Owner W. V. Johnston, a veteran of 40 years in logging, finds his GM Diesel "completely satisfactory."

Pride of the
woods when
it comes to

PULL...

**GM
DIESEL
POWER**

SNAKING 35-foot logs over high mountains and across rough ground is no cinch. It's a job that calls for plenty of power, instantly available. That's the kind of power GM Series 71 Diesel engines provide.

Their 2-cycle principle—power at every downstroke—gives instant acceleration, fast haul-back speed and tremendous line pull.

Add to these advantages their rugged durability, portability and economy of operation and you'll see why loggers in the big woods are turning to GM Diesels. Get all the interesting details. Consult your local dealer or write direct to us.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 200 H.P.

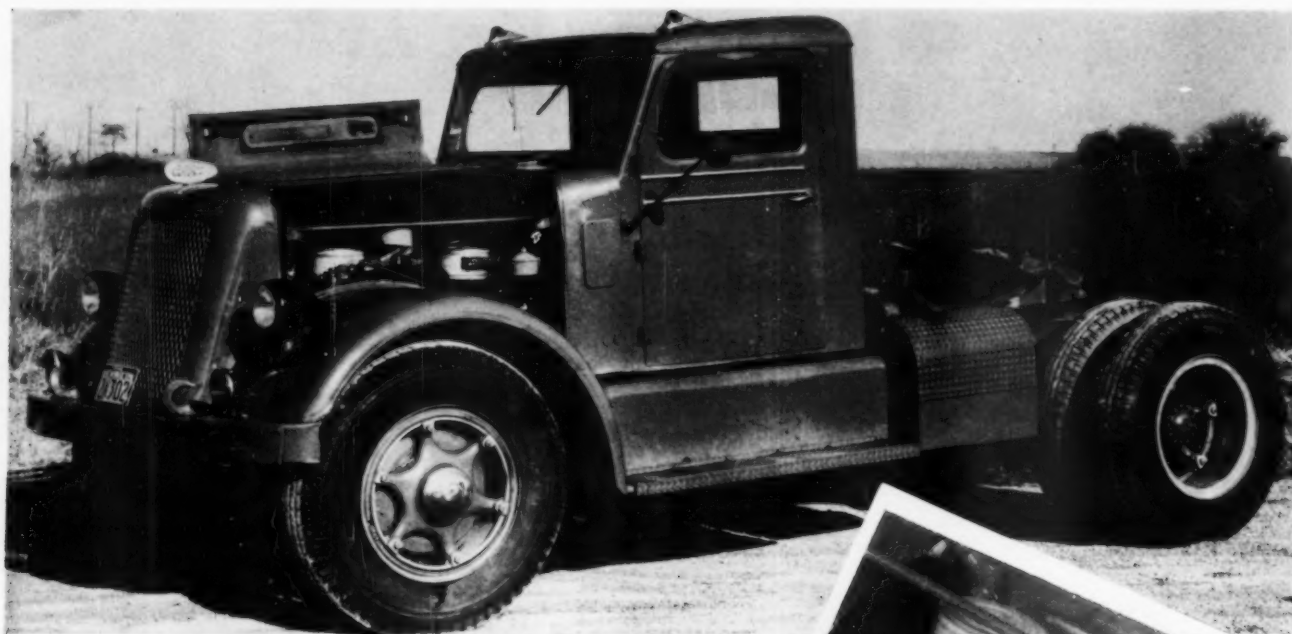
DETROIT 25, MICHIGAN

MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAVN WITHOUT THE BULK





Corbett Truck-tractor equipped with a Sheppard diesel recently averaged 5 miles per gallon of fuel hauling fully loaded trailer.

A New Truck-Diesel Combination

DAN GIBSON, Sheppard dealer for the State of Virginia recently tested a new diesel rig for one of the large fleet owners in the state. The rig he tested was a Corbett truck tractor powered with a Sheppard 6 cyl. diesel engine.

The test was conducted over the scenic but rugged Skyline Drive which overlooks the blue Shenandoah valley to the west and the Piedmont of Virginia to the east. It was a 401-mile test run which reached an elevation of 3600 ft. at one particular spot along the route.

The weight of the truck, trailer and load totalled 41,600 lbs., enough to keep the diesel contented.

At the same time a similar unit with a gasoline engine was tested over the same route. All the conditions were the same. The results showed some startling fuel consumption figures.

The gasoline engine, during the 401 mile run consumed 93 gal. of fuel costing \$23.35, giving the gasoline engined truck approximately 4.3 miles per gal. of fuel. The diesel on the other hand consumed only 59 gal. of diesel fuel at a total

fuel cost of only \$8.26, giving the diesel a fuel consumption of 6.8 miles per gal. Figured on a cost per mile basis, the gasoline engined truck averaged 5.8 cents per mile, the diesel fuel costs were 2.05 cents per mile. It is easy to tote up the savings for an operator with 50 or a 100 trucks in service if they were dieselized. Many operators are now realizing these savings with diesels.

The installation was relatively simple to make. A 6-cyl. Sheppard diesel rated for 75 hp. at 1800 rpm. was equipped with a two cylinder Bendix Westinghouse air compressor mounted on the fuel pump side of the gear cover for operation of the air braking equipment. Front and rear hangers used to mount the engine were built by Sheppard.

A special throttle was used. It is equipped with an idling stop and is standard on Sheppard truck and bus installations.

The diesel was equipped with an Auto-Lite starter. A Delco-Remy fused type, series-parallel starting switch was installed to permit the use of 24-volt current for starting and 6 or 12-volt current for all other accessories on the truck.



View of engine installation showing Sheppard diesel. Engine is rated 75 hp at 1800 rpm.

An engine tachometer drive was installed with a 4-ft. cable extending to the instrument panel in the cab of the truck. The existing exhaust system and muffler were retained in the new installation.

Oil and air lines to the compressor were of the flexible type. Standard gasoline engine mountings and dampers were utilized in this installation.

The Sheppard Company is now working on a packaged unit, including diesel engine and accessories, which will fit most of the trucks now being built in this country.

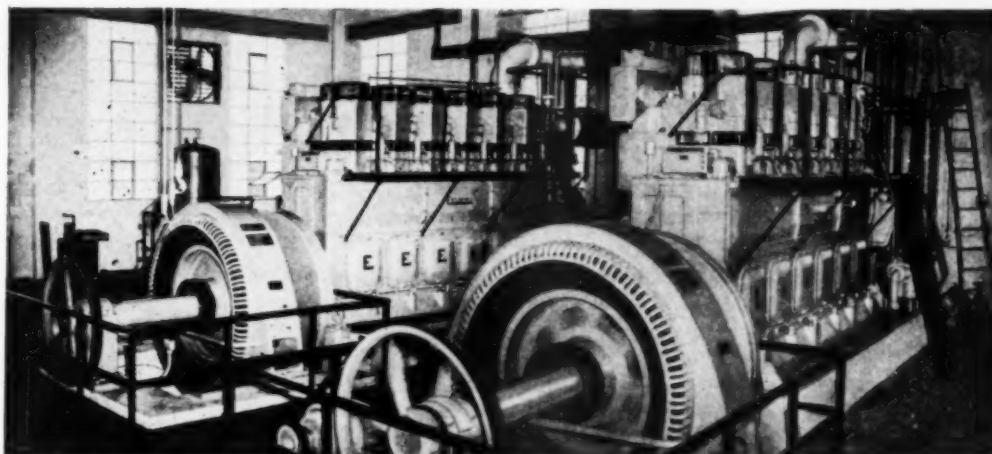
One advantage which the Sheppard diesel presently has is that it can utilize low cost diesel fuel. At the present time with all petroleum products at higher prices an engine which can utilize inexpensive fuel has a distinct advantage. Number 3 furnace oil can be used in Sheppard diesels.

**FOR REA CO-OPS, TOO —
ENTERPRISE DIESELS OFFER
DEPENDABLE POWER FOR
PRESENT NEEDS PLUS FUTURE GROWTH**



A familiar sight in generating plants throughout the world, Enterprise Diesels continue to set the pace in power progress—dependably and economically fulfilling power requirements within their broad range of application. Such outstanding REA projects as the recently completed Glades Electric Cooperative at Moore Haven, Florida, is further testimony to Enterprise's story of high quality equipment doing everything de-

manded of it—and more. These two Enterprise DSQ-36 Diesel generating sets are daily proving their worth in supplying a higher continuous electrical output to the co-op than ever before, at comparatively low cost. Enterprise engineers—backed by 62 years of experience in the manufacture of power equipment—will welcome the opportunity of showing you how to save with Enterprise Diesels, choice of the power experts.



Enterprise 4-Cycle Diesel Engines and Generating Sets are available in a wide range of sizes and models up to 1800 HP per unit, turbocharged or normally aspirated. Ask for new Bulletin No. 203 for further information.



ENTERPRISE Diesels

ENTERPRISE ENGINE & FOUNDRY CO.
18TH & FLORIDA STS., SAN FRANCISCO 10, CALIF. OFFICES IN PRINCIPAL CITIES

S

Supervising & Operating Engineers Section

CONDUCTED BY R. L. GREGORY

"The Use of Straight Crudes as Diesel Fuels"

DURING the past several weeks, this department has received several communications and inquiries on the above subject. These inquiries have been the result of the efforts of Supervisors and Operators, looking for some means of cutting operating costs. Due to the increased cost for both fuel and labor over the last few years, operating costs have advanced alarmingly, and when the Supervisory personnel reaches a point where these costs equal or surpass revenue, they are faced with a real problem in "keeping out of the red."

Now the writer will be frank in stating that his knowledge as to the above subject is limited at the moment to a few facts which have been garnered from certain tests that have been recently made on the use of heavy crudes by some of the prominent diesel manufacturers, and while this department is endeavoring to accumulate verified data which can be passed on to our readers, the subject at present is in the embryo stage.

We do know that there are several plants in the country, operating diesels on straight crude. We do know that these plants are equipped with special centrifuging and fuel handling equipment, that they also have ample heating facilities to maintain the proper temperatures to keep the viscosity of the fuel within range. Heavy crudes from various fields vary greatly in viscosity. They also vary as to impurities etc. Therefore they must be specially handled to obtain proper efficiencies.

Now as to the aforementioned tests. The particular test referred to was conducted on a large engine with special fuel injection equipment in some instances. Cylinders one and two were fed with the regular diesel fuel used in the plant. Cylinders three and four were operated on straight heavy crude (centrifuged and heated), while cylinders five and six were operated on the same crude with additives added in proper proportion.

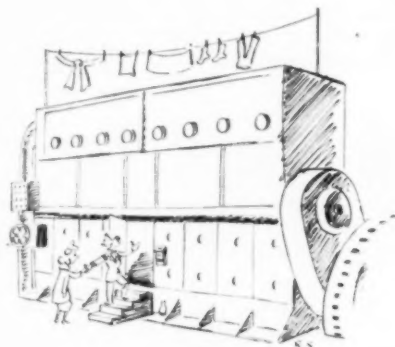
The test was carried on for a considerable period, and upon completion a full inspection was given to fuel injection equipment, pumps, pistons, rings, liners and any parts effected by the fuel. The re-

sults as noted on cylinders one and two were normal as would be expected. The fuel equipment was clean, rings were free, the pistons and cylinder walls were free from varnish and stains.

Cylinders three and four were the dirtiest, the fuel injection equipment containing some foreign matter, the pistons were slightly coated with varnish and stain and the rings had considerable carbon deposit. Cylinders five and six were in considerably better shape. The fuel injection equipment was fairly clean as were the pumps. There was no sticking of the rings, and the pistons had a slight trace of stain but a minimum of varnish deposit.

The efficiency of the various cylinders under test varied in practically the same proportion as the other conditions, although there was not as wide a variation as one might anticipate. The crude that was treated with an additive was nearly in line with that of the regular diesel fuel as far as efficiency was concerned. The ports on cylinders five and six were somewhat cleaner than the other four cylinders.

One thing was noticeable. If one were to burn straight heavy crude without additives, there would be more maintenance necessary due to cleaning of fuel system parts. Another very important point would be the fact that all starting and stopping should be done on light fuel oil.



"Watch out for the cranks, honey, and it will make a nice little home."

This would keep the fuel equipment in fairly clean condition for starting.

As mentioned earlier, there are several plants in the country operating on heavy crude and if any of our readers have had any experience with such operation, their comments and experiences would be a welcome asset to the data we are trying to compile on the subject.

In the next issue, this department hopes to have available, certain photographs showing the effect upon the equipment of the use of both regular fuel and straight crudes. This will give a more comprehensive idea as to just what the results have been under test. At any rate this seems to be a fertile field for investigation and thought and any cut in operating materials which will effect costs is always a welcome one.

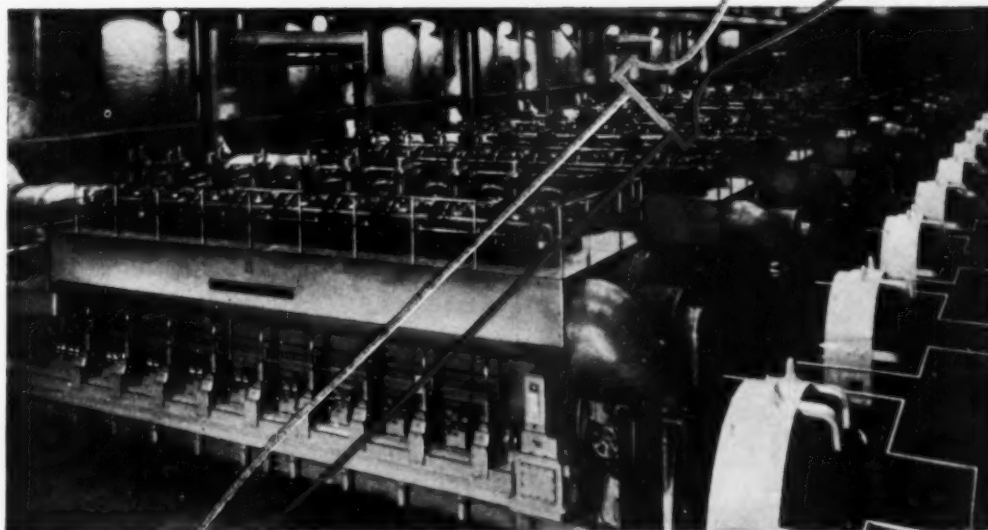
The Use of Crude Oil in Marine Diesels

Crude or Bunker "C" oil has long been used by owners and operators of marine diesels. This is especially true of the European ship operators who have taken advantage of the lower price offered by bunker oils. The average world price of fuel today based upon a large number of ports is \$28.00 per ton for diesel oil in comparison with \$21.60 per ton for boiler oil. Even with this 30% price differential, a diesel ship burning diesel fuel will operate at a fuel cost of only 82% of the cost for a steam turbine vessel burning Bunker "C" oil. A diesel ship burning this lower cost fuel would far outshine a steam job.

The Sun Oil Company has been using Bunker "C" oil in its tankers since 1934. According to Charles Boyle of that company, Sun overcame the disadvantage of higher diesel fuel costs by equipping their diesels with proper fuel tips and by changing engine timing to use this low cost fuel. In addition, heating and centrifuging of the oil was adopted. The oil used by the company's diesels is not specially treated, as a matter of fact, any Bunker "C" oil with viscosity limits of 85 Furol 122° F. can be used. Fuels with a viscosity as high as 105 Saybolt Furol 122° F. have been burned on occasion. Conradson carbon and sulphur in the average run of Bunker "C" do not exceed the 5.0% maximum and 1.5% sulphur limits.

FEEDING PROBLEMS...

by Drum or Eye Dropper



Regardless of Size or Type


THE SCOPE of lubricating problems on diesel engine equipment ranges from mammoth low R.P.M. units to small high speed, high output engines. But regardless of size or type of diesel equipment it is an important investment to you. And frequently it is an investment which can only be protected by special "care and feeding." When this is the case, the services of a seasoned lubrication engineer are invaluable.

Cities Service lubrication engineers are thor-

oughly grounded in up-to-the-minute lubrication techniques on diesel engines. They know the proper types and grades of lubricants and fuels that will best meet your individual requirements.

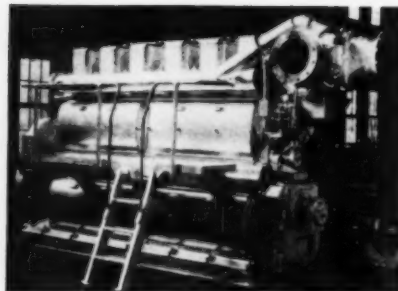
At absolutely no obligation to you a Cities Service lubrication engineer will make a thorough, on-the-spot analysis of your lubrication requirements. His recommendations may substantially reduce your operation and maintenance costs. Write Cities Service Oil Company, Room 285, Sixty Wall Tower, New York 5, N.Y.

Free—A new 64 page booklet entitled "Diesel Engine Lubrication" is yours for the asking. Write for your copy of this fact-filled lubrication guide today.

CITIES  SERVICE

Alco 1000 hp. Diesels to be Built in Canada

THE Dominion Engineering Works, Ltd. of Montreal will produce 1000-hp. diesel engines of proved design for the diesel-electric switching locomotives manufactured by Montreal Locomotive Works, Ltd. for Canadian and foreign railways. The announcement was made jointly by Sir Frederick Carson, Executive Vice President of the locomotive firm and Mr. H. G. Welsford, Vice President and General Manager of Dominion Engineering Works. Beginning in 1949, Dominion Engineering will manufacture the Alco in-line, supercharged diesel engine which was developed and produced in the United States by the American



Alco 1000 hp. supercharged, 12 1/2 x 13 railroad diesel to be built by Canadian firm.

Locomotive Company, affiliate of Montreal Locomotive Works. The two companies envision a long-range market for diesel-electric locomotives.

Dominion Engineering Works is the second prominent Canadian firm to join forces with Montreal Locomotive Works in production of diesel-electric locomotives. In May of this year, Canadian General Electric Company, Ltd. and MLW completed a trade agreement calling for CGE to manufacture all the necessary electrical equipment. Now Canada's largest builder of locomotives, its largest manufacturer of electrical equipment. Now Canada's largest builder of locomotives, its largest manufacturer of electrical equipment, and its largest producer of diesel engines comprise a three-in-one team united to produce this newest and most successful form of railway motive power.

MLW began the production of diesel-electric locomotives only this year, although conversion of its plant facilities in preparation for the new line started nearly a year and a half ago. The first MLW-CGE diesel-electric, a 1,000 hp. switcher for the Canadian Pacific Railway, was exhibited at the Canadian International Trade Fair in June.

Dominion Engineering already has made much progress in readying its big Lachine, Quebec plant for the production of the new diesel engine and it is expected that the first Alco type diesel engine will come off its production line on or before August 1, 1949.

The Alco in-line diesel engine probably is used in more diesel-electric switching locomotives than any other type. More than 1,650 of the 1000-hp. type alone, which will be produced by Dominion Engineering, are used in locomotives throughout the world. Seventy-two diesel switchers on Canadian railways are powered by this engine.

Canadian Distributor Named By Lubaid

The Lubaid Co., Milwaukee, Wisconsin, has announced the appointment of an Eastern Canadian Distributor to handle *Liquid Sootout* in that area.

Liquid Sootout was developed by the Lubaid Co. prior to World War II, after prolonged experimentation and research. It is emphasized that *Liquid Sootout* has long passed the experimental stage, since it has been used with continuous and sustained success by a large number of operators for more than seven years. It is a highly effective fuel oil additive that affords protection in fuel oil systems against sludge formations, aids in keeping strainers and fuel oil heaters clean, and in disintegrating carbon formation on burner plates and tips. It results in better atomization of the fuel.

The Lubaid Co., also manufactures Lubaid D, widely used in the treatment of diesel engine fuels for disintegrating carbon binders, gum, and engine varnish, for freeing valves and rings, and to aid in keeping injector valves and nozzles clean. For further information concerning this product write the Lubaid Co., Milwaukee, Wis.

There's a HILCO that will best fit into your Lubricating and Fuel Oil Filtering Plans . . .

HILCO HYFLOW OIL FILTERS "S" SERIES

HILCO HYFLOW OIL FILTERS "R" SERIES SPACE SAVERS

For lubricating oil or storage to engine fuel oil filtering using 5" x 11" and 7 1/4" x 18" Filter elements. Easy and quick to service.

For lube oil using one or a multiple of 11" x 18" Filter cartridges easily handled by the operator, offering large filter area and proper depth to assure complete saturation of filter material. Available with and without heaters.

FACTORY FILLED THROW-AWAY FILTER CARTRIDGE*

REPACKABLE FILTER CARTRIDGE*

*Both are interchangeable at any time.

Hilco Hyflow Oil Filters use Hiltex-Fuller's Earth for filtering straight mineral and fuel oil or Hiltex-Cellulose, the oil-purpose filtering media for heavy duty detergent oils and fuel oil.

HILCO HYFLOW OIL FILTERS "C" SERIES

HILCO OIL RECLAIMERS

For Lube and Bulk Fuel using one or a multiple of 7 1/4" x 18" Filter cartridges offering the maximum in filter area and correct depth for high flow rates and efficient filtration. Available in simplex type with or without heaters, duplex without heaters.

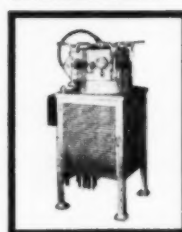
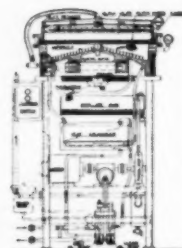
**CLEAN OIL MEANS CLEAN ENGINES
LOWER MAINTENANCE COSTS . . .**

WRITE TO-DAY! FREE LITERATURE
LET US RECOMMEND THE CORRECT OIL PURIFICATION EQUIPMENT

THE HILLIARD CORPORATION **122 W. Fourth St., Elmira, N. Y.**

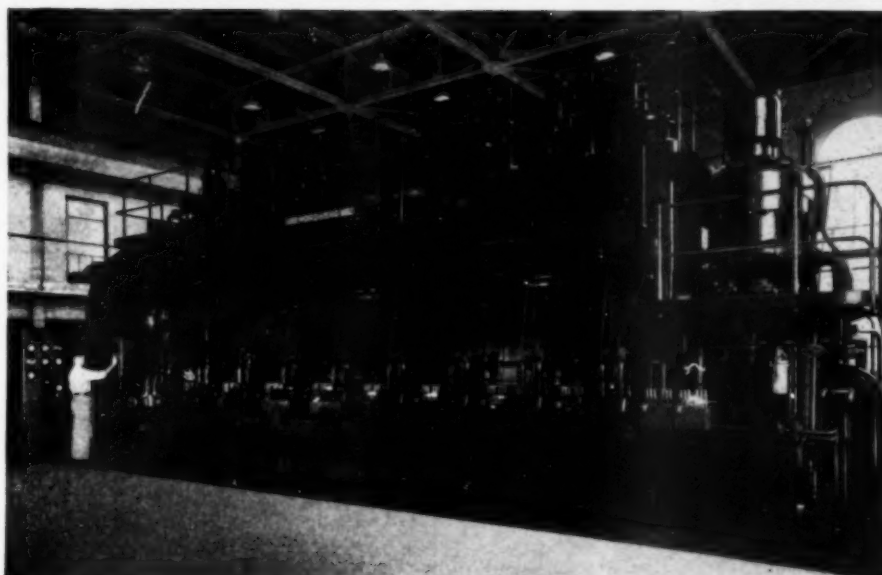
For direct connecting to one or more engines for perfect and complete lube oil purification—removing carbon, sludge, abrasives, tarry matter, and acids, water and fuel dilution—and color restoration.

Hiltex-Fuller's Earth for filtering straight mineral oils—ADSTAY DIECS for heavy duty detergent oils.



3rd NORDBERG DIESEL

for
GRAND HAVEN



1937 ... ADDITION TO THE EXISTING POWER PLANT MADE AND INSTALLATION OF FIRST NORDBERG DIESEL, A 2250 HORSEPOWER UNIT

1941 ... INSTALLED THEIR SECOND NORDBERG DIESEL - A 3850 HORSEPOWER UNIT.

1948 ... THE THIRD NORDBERG DIESEL INSTALLED - ANOTHER 3850 HORSEPOWER UNIT, LOCATED IN A NEW POWER PLANT ADDITION (ENGINE AND BUILDING ILLUSTRATED)

THE story of power plant progress in keeping up to ever-increasing electric demand in Grand Haven, Michigan, is typical of many similar municipalities. Starting over fifty years ago with a modest steam engine plant, Grand Haven has progressed through turbines, smaller 4-cycle engines, and ultimately to the use of large, sturdy Nordberg 2-cycle Diesels as their main power supply. Their recent selection of a third Nordberg unit provides further proof of the proven dependability of these popular engines.

It is interesting to note that the established economy of Nordberg Diesels is further enhanced in the Grand Haven plant through their ability to operate efficiently on a heavy, straight-run residual fuel oil usually ranging from 500 to 1000 S.S.U. at 100° F. This fuel is readily obtained locally.

This is just one example of the varied power problems being solved better, more economically with Nordberg Diesels . . . in a wide range of sizes from 10 to 8500 H.P.

NORDBERG MFG. CO., MILWAUKEE 7, WIS.



Air-Maze Appoints R. S. Purinton

MR. R. S. PURINTON has been appointed factory representative covering Ohio, Kentucky, and West Virginia for the Air-Maze Corporation, according to W. B. Watterson, Vice President in charge of sales.

A former Lieutenant Colonel in the Army Air Force, Mr. Purinton was previously with Republic Steel in Massillon and Buffalo. He is a graduate mechanical engineer from Cornell University and resides with his wife and child at 3664 Latimore Road, Shaker Heights, Ohio.

Twin Disc Names J. H. Batten, President

NEWLY elected president of the Twin Disc Clutch Company is John H. Batten, according to a recent announcement by the company.

Mr. P. H. Batten, founder of the company, who previously has held the positions of president and chairman of the board, will maintain an active interest in company affairs as chairman of the Board of Directors.

The new president joined the Twin Disc Clutch



P. H. Batten

J. H. Batten

Company in 1935 following his graduation from Yale University with a degree in Business Administration.

In 1937, Mr. Batten was appointed a member of the Board of Directors and has continued to serve on the board since that date. In 1940 he was named Assistant General Manager and in this capacity assumed considerable responsibility in managing company affairs as assistant to the president. In 1942 he assumed additional duties as Assistant Treasurer of the company. He was named executive Vice President in 1945.

Lima-Hamilton Appoints E. C. Schum

WALTER A. RENTSCHLER, Vice President of Lima-Hamilton Corporation, recently announced the appointment of Eugene C. Schum as Diesel Engine Sales Manager of the Hamilton Division of the Lima-Hamilton Corporation. Mr. Schum will make his headquarters in Hamilton, Ohio.



E. C. Schum

Mr. Schum is a graduate of Cornell University. He joined the Nordberg Engineering Department in 1935. From 1942 to 1945, he served in the Internal Combustion Engine Section of the Navy's Bureau of Ships with a rank of Lieutenant Commander, U.S.N.R. From 1945 until he joined the Lima-Hamilton Corporation, Mr. Schum held the position of District Sales Manager of the Nordberg Manufacturing Company.

Leece Neville Booklet Lists Distributors

THE Leece-Neville Company has announced publication of a booklet listing the names and addresses of all of its authorized distributors and service stations. Copies may be obtained free of charge from P. K. Bremser, service manager, at 5363 Hamilton Ave., Cleveland 14, Ohio.

The right size FILTER



for any size ENGINE

The best way to protect *any size engine* against impurities in fuels and lubricants is to equip it with the *proper filter*. Over 100 different sizes and shapes of Winslow Filters offer you this promise of dependable, money-saving operation. Write for more details.

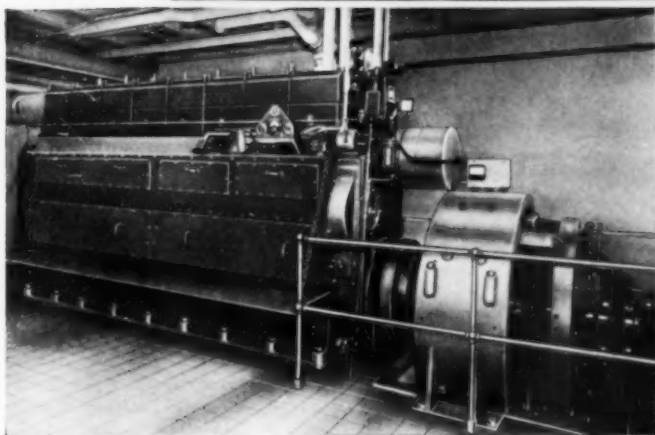
WINSLOW FILTERS

AD-4981

Winslow Engineering Company

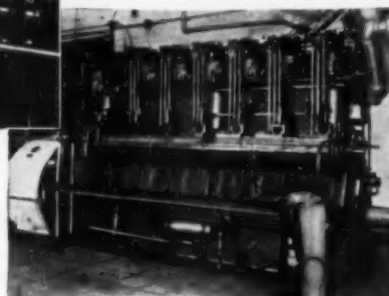
4069 Hollis Street • Oakland 8, California

Naturally they bought a second CP Diesel



New 640 H.P., 720 R.P.M. CP Diesel Engine driving a 425 kilowatt DC Generator.

Original 300 H.P., 400 R.P.M. CP Diesel Engine driving a 200 kilowatt DC Generator.



Twelve years ago one of America's largest laundries decided to install a 300 H.P. Diesel to supplement the laundry's steam power units and provide a favorable heat balance. After a thorough investigation, the CP 300 H.P. unit illustrated was installed.

So satisfactory has been its service that when additional power demands called for further generating equipment, it was another CP Diesel that was purchased. The general manager commented:

"What was more natural after years of dependable operation and the best in service and cooperation by the manufacturer, than the selection of a second Chicago Pneumatic Diesel."

For the power requirements of your own plant, you can select, from the wide Chicago Pneumatic line, a Diesel that will give similarly dependable and satisfactory service.

Write for detailed information.



**CHICAGO PNEUMATIC
TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Berliner Joins Maysteel

F. C. BERLINER has joined Maysteel Products, Inc. as Sales Manager, it was announced by Clinton E. Stryker, President. Berliner in recent years has been associated with the fabricated sheet metal industry.

Maysteel Products, Inc. has plants in Mayville, Sheboygan and Hartford, Wisconsin, and executive and sales offices in Milwaukee. Among Maysteel's products are cabinets, stands, boxes, tanks, engine housings, and sheet metal for industrial equipment and machine tools, all built to customer specification.

Robbins to Head Hill Engine Sales

HERMAN B. ROBBINS has been appointed Manager of the new Hill Diesel Engine Division of Drake America Corporation, according to Dennis E. Tiberius, Director of Sales for Drake America.

Mr. Robbins, who formerly was in charge of export sales of Hill engines, will now take charge of all sales activities of the division—both export and domestic. One of Mr. Robbins' first acts will be to expand the domestic distribution setup for Hill. To accomplish this, he is planning a series of trips in the near future to appoint additional

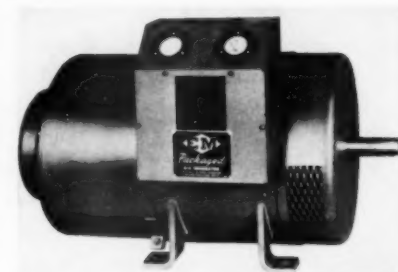


Herman B. Robbins

distributors. He also will visit established distributors and dealers in all sections of the country to explain coming phases of the merchandising and sales promotion program for Hill in 1949.

Drake America Corporation acquired controlling interest in the Hill Diesel Engine Corp. of Lansing, Mich., early in 1948. Operations at the Hill factory continue under Joseph A. Archer, General Manager, and his staff. The factory is now producing the "R" series of small diesel engines, ranging from 10 to 60 hp., which will be marketed as power units, marine units, or bare engines. A line of electric generating sets, ranging from 7½ to 30 kilowatts, also in being assembled.

New Electric Machinery Generators

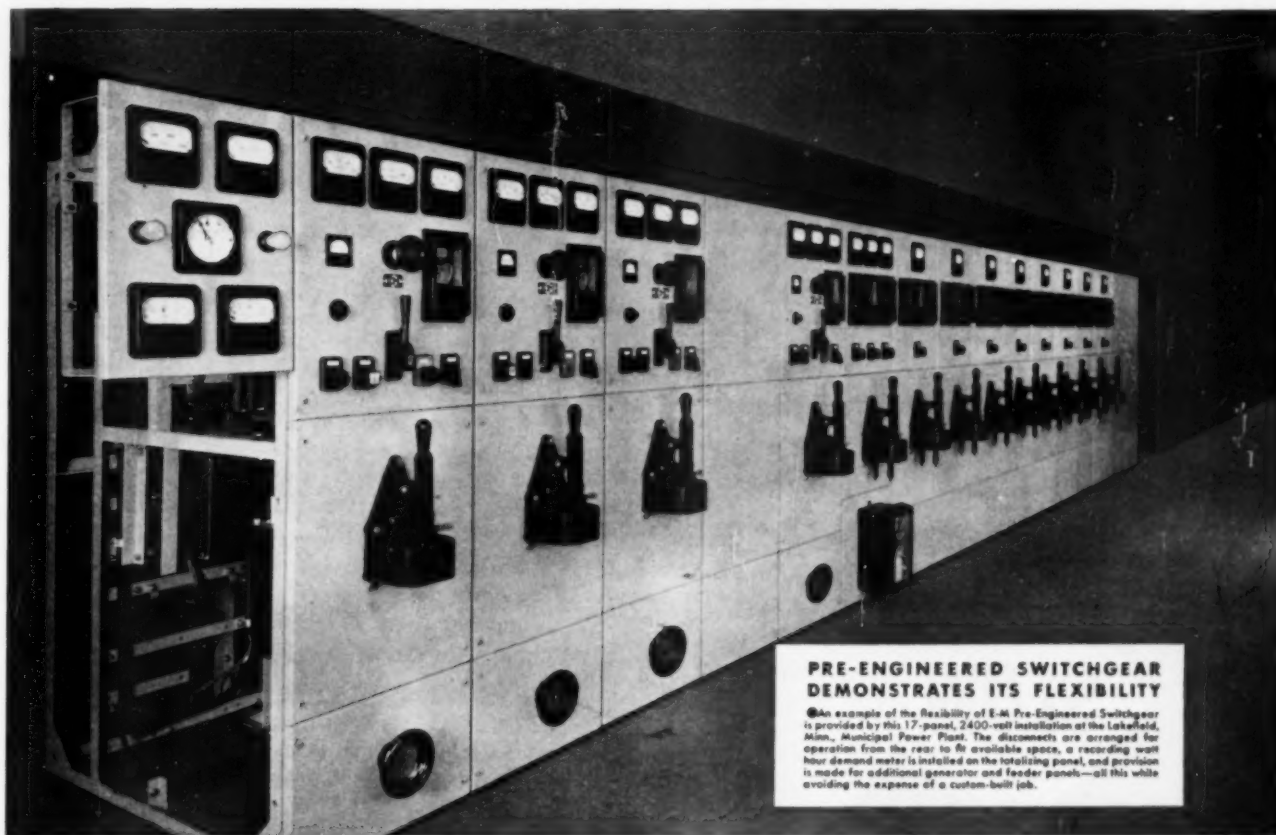


Electric Machinery "Packaged" AC generator.

NEW "Packaged" Generator line announced by Electric Machinery Mfg. Company in December 1947 featuring complete unit of generator, exciter and built-in voltage regulating circuit is now extended to include self-contained main generator switch on ratings up to 15 kw. No additional switches or controls necessary. Unit is connected direct to load.

Complete modern line features units in single and 3 phase ratings up to 150 kw at speeds 900 rpm to 1800 rpm. Information available in Publication 2100-115. Write Electric Machinery Mfg. Co., Minneapolis 13, Minn.

| | | |
|----------------------------|---|------------------------------|
| Learning Your Clutch Needs | If You Don't See the Clutch You Want — Ask ROCKFORD | Automotive and Aircraft |
| Analyzing the Problem | | Trucks and Buses |
| Designing the Clutch | | Tractors and Road Machines |
| Planning Production | | Farm Machines and Implements |
| Tooling Up | | Oil Field Rigs and Pumps |
| Manufacturing | ROCKFORD CLUTCHES | Industrial |
| Checking and Testing | <p>The clutch shown above — used in farm tractor LIVE POWER TAKE-OFFS — enables the harvesting unit to be controlled independently of tractor propulsion. It is used in other ways and in other industries. And it is but one of many other types and sizes of ROCKFORD CLUTCHES that have been designed and built to meet specific needs. If you have a power control or power transmission problem, our engineers can help you solve it. Write for our latest bulletin which shows typical ROCKFORD CLUTCHES and POWER TAKE-OFF installations with diagrams of unique applications, capacity tables and specifications.</p> | Mowers and Light Machines |
| Supervising Installation | | Engines and Marine Units |
| Servicing | | Machine Tools |
| | | Production Units |
| | ROCKFORD CLUTCH DIVISION 8080 WABNER 1201 Eighteenth Street, Rockford, Illinois | |



**PRE-ENGINEERED SWITCHGEAR
DEMONSTRATES ITS FLEXIBILITY**

●An example of the flexibility of E-M Pre-Engineered Switchgear is provided by this 17-panel, 2400-volt installation at the Lakefield, Minn., Municipal Power Plant. The disconnects are arranged for operation from the rear to fit available space, a recording watt hour demand meter is installed on the totalizing panel, and provision is made for additional generator and feeder panels—all this while avoiding the expense of a custom-built job.

All the Advantages of Custom-Built Generator Switchgear without the Extra Cost!

THERE are several ways to obtain switchgear. You can go to the greater cost of having one custom-built.

You can select ready-made inflexible stock units that do not precisely meet all the individual requirements of your installation.

And the third way, the most satisfactory way, is to select a time-tested and field-proved E-M Pre-Engineered Switchgear.

For E-M Switchgear gives all these advantages . . . all components are pre-engineered and coordinated with each other. The gear is designed to provide switching protection for equipment and operators, metering, voltage regulation and for

synchronizing generators. It is dead-front as our minimum and can be fully enclosed for even greater safety.

In addition E-M design provides a flexibility that permits additional meters or controls to meet peculiar needs.

This easy-to-buy, pre-engineered switchgear is a profitable, wise, modern choice. For full information, talk with your nearest E-M field engineer or write for specifications, panel outlines, and line diagrams of connections of basic units in Publication 194.

ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

4200-TPA-2089



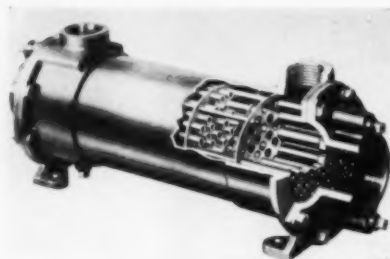
**SPECIALISTS IN GENERATOR
AND SWITCHGEAR ENGINEERING**

Redesigned Ross Heat Exchangers

AN EXTENSIVELY redesigned line of mass produced, standardized heat exchangers was announced recently by Ross Heater & Mfg. Co., Inc.

The new type "BCF" exchanger is the product of many years of development. This research has enabled the manufacturer to determine the design features, sizes and capacities in greatest demand, to standardize them and place them into mass production.

While the "BCF," from its wide use in jacket water and lube oil cooling, has long been referred to as a cooler, it is also a heat exchanger



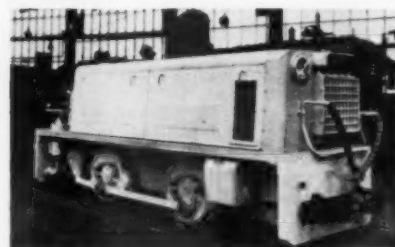
Ross BCF heat exchanger

in the true sense of the word. It is said to be

equally effective in heat recovery, vapor condensing and process heating applications.

Detailed descriptive literature (Bulletin 1.1K1) on this new light weight non-ferrous unit is available without cost from Ross Heater & Mfg. Co., Inc., 1407 West Ave., Buffalo 13, N. Y.

70 H.P. British Mine Locomotive



THE new 70 bhp. flameproof mine diesel locomotive introduced by the Hunslet Engine Co. Ltd. as the fourth of its standard models has two principal objects. The first is to give accelerated traffic performance in coal haulage and man-riding, with four gear steps up to a top speed of 14½ mph.; the second is to spread the whole British mines locomotive program over a wider section of industry by varying the construction from the existing models without giving up the main-line standards of construction which this builder considers essential.

Axial Compressors and Gas Turbines to be Clark Products

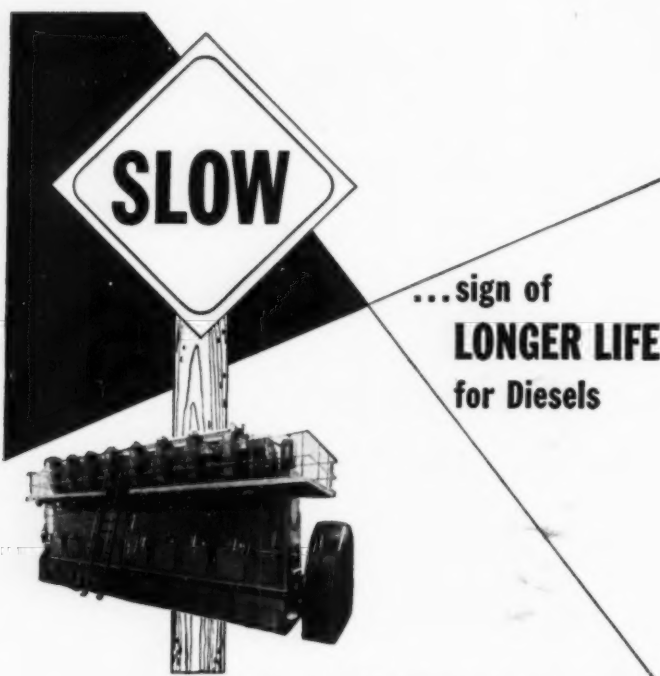
ANNOUNCEMENT was recently made of a joint arrangement between Clark Bros. Co., Inc. and Fredric Flader, Inc., whereby Clark Bros. will manufacture and distribute gas turbines and axial compressors of Flader design for general industrial use. The agreement contemplates that Fredric Flader, Inc., will be responsible for research, engineering and design and that Clark Bros. Co., Inc. will manufacture and sell these products.

Diesel Progress London Address Changed

MR. E. H. DODDRELL, representative for DIESEL PROGRESS in England and on the Continent for the past several years, is now located at 342 St. Paul's Corner, Ludgate Hill, London E.C. 4, England. Mr. Doddrell will gladly quote advertising rates payable in Sterling at his office. He will also accept subscriptions to DIESEL PROGRESS payable at £1-17s per year, and he will deliver copies of the DIESEL ENGINE CATALOG from London stock at £2-10s per copy.

Russians Buy Diesel-Electric Units in England

FROM the Chicago Tribune of December 13th we learn that a contract has been negotiated between the Russian trade delegation and the British Electrical Engineering Company of Loughborough and its associate, J. and H. McLaren of Leeds, for 2,850 diesel generating units of 50 kw. each, the deal involving over \$20,000,000.



...sign of
LONGER LIFE
for Diesels

Like any other piece of machinery, the faster a Diesel runs, the faster it wears itself out. If you skimp on size and depend on speed to develop power, the result is bound to be higher maintenance cost and shorter life.

FULTON Diesels are engineered to give you more power at lower speed—which adds years and years to their lives. Consider the cost **per year of service**, not first cost alone, when you choose your Diesel. It pays!

TYPE KS: 6 or 8 cylinders—delivering 1840 to 4000 HP at 240 to 257 RPM.

TYPE BGS: 5, 6, 7 or 8 cylinders—delivering 750 to 1900 HP at 257 to 277 RPM.

FULTON DIESELS—the best buy for the long run

FULTON IRON WORKS COMPANY

SAINT LOUIS 14, MISSOURI
New York Office: 82 Wall Street, New York 5



4 NEW — MODEL 16-278A GENERAL MOTORS DIESEL ENGINES

8 $\frac{3}{4}$ " Bore—10 $\frac{1}{2}$ " Stroke
1600 H.P. at 750 RPM
1440 H.P. at 720 RPM

Complete with
Harrison Lube Oil Coolers
Harrison Fresh Water
Coolers
Commercial Lube Oil
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Maxim Silencers —
Model MM
Serial Numbers Engines
11907 — 11909 —
11920 — 11919

Engines No.
11920
11919
are Port and
Starboard

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BOSTON METALS company

313 E. Baltimore St. Baltimore 2, Md.
Phone: Curtis 5050 • Curtis 5051 • Curtis 5052

THE MODERN LUBE OIL AND JACKET WATER COOLER—**GRAHAM MONOBOLT**



A compact and highly efficient cooler recommended for all engine services.

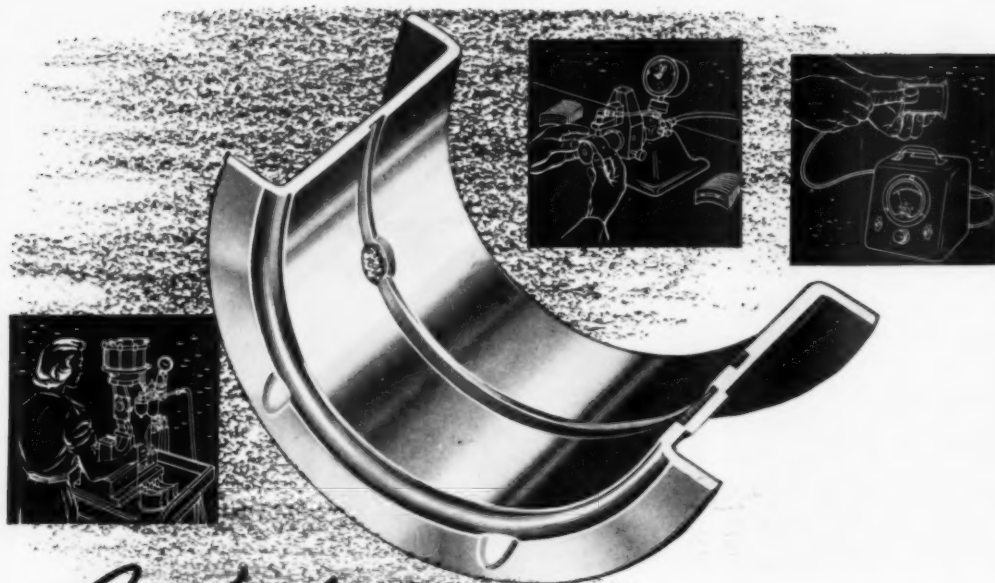
Graham Monobolt coolers may be disassembled for cleaning or inspection in a matter of minutes; they

incorporate many other improvements in construction details that result in a top-notch cooler.

Deliveries are good and prices are competitive.

Ask for leaflet MP-119 for full details.

GRAHAM MANUFACTURING CO., INC. 415 Lexington Ave., New York 17, N.Y.



Combining PRODUCTION IN THE MILLIONS WITH QUALITY IN THE INDIVIDUAL BEARING

To assure top quality in mass production of sleeve bearings, at low cost, our Quality Control and Production Methods organization conducts as many as 108 separate tests for material quality and physical accuracy of the individual bearing. Specialists for almost 50 years, our six-plant organization is tailored to the peculiar needs of sleeve bearing production—from original research to field tests of the finished product. Our engineering department will gladly consult with you on your problems.

28 PRECISE MACHINE OPERATIONS

84 MEASUREMENT CHECKS

24 ADDITIONAL TESTS

are conducted on a strip-type, copper-lead lined, steel-backed flanged bearing.



HIGH SPEED, high temperature, automotive type bearings available in many combinations.



SPEED & LOAD bearings for pumps, compressors, industrial electric motors and similar uses.



HEAVY LOAD for big Diesels, power plants, etc.—bearings up to 27½" O.D., steel and bronze back.



BRONZE PARTS in many shapes, sizes; thrust washers, bushings; for many types of applications.

Power goes to work smoothly through

FEDERAL-MOGUL

FEDERAL-MOGUL CORPORATION



11039 SHOEMAKER, DETROIT 13, MICH.

This emblem



on your equipment is your assurance of service satisfaction

IT STANDS FOR:

1. QUICK SERVICE . . . Stewart & Stevenson consistently maintains the largest distributor stock of replacement parts in the nation, plus the largest distributor staff of trained mechanics. Stewart & Stevenson offers exchange engine assembly service at flat prices which are often lower than the cost of conventional overhauls. Stewart & Stevenson servicemen are equipped to get the job done. They drive fast panel trucks fitted with parts bins and tools. They get there faster and have the parts to do the job when they arrive.

2. FULL RESPONSIBILITY . . . When you buy from Stewart & Stevenson, your engine is *guaranteed* to do

a job for you—not just develop a certain horsepower. Stewart & Stevenson assume the responsibility for making the engine do a certain job for *you* on the basis that if it fails and they can't make it do as specified then they will remove it and refund any money paid.

3. COMPETENT ENGINEERING . . . Successful engine performance depends upon proper application to the load. Stewart & Stevenson maintains a staff of competent engineers who have a backlog of experience gained through thousands of engine applications in every industry and under every operating condition.

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McALLEN
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Phone 1760

WICHITA FALLS
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Phone 2-3319

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Phone 2807

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Phone 2-7338

DEALERS:

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Baird Truck & Equipment Company, San Angelo, Texas
Phillips-Torreson Company, San Antonio, Texas
Standard Engine Company, Longview, Texas

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SALES REPRESENTATIVES
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Chrysler Pneumatic Gas and Diesel Engines 200 to 1500
horsepower • Continental Red Seal Gas and Diesel En-
gines 15 to 200 horsepower • Adair Hydraulic Controls
Gardner-Dauer Pumps

FABRICATORS OF: Electric Power Units • Electrical Control Equipment •
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DIESEL
POWER



PARTS • SERVICE

ANYTIME • ANYWHERE

THE NATION'S LARGEST DISTRIBUTORS OF GM DIESEL ENGINES

Bohuslav Joins LeTourneau

R. G. LeTOURNEAU, President of R. G. LeTourneau, Inc., recently announced the appointment of **Hans A. Bohuslav** as special engineering consultant to Mr. LeTourneau. Mr. Bohuslav goes to the LeTourneau Co. from Engineering Controls, Inc., of Los Angeles, California, where he was Vice President in charge of Engineering and Production. Bohuslav is recognized throughout the engineering profession as an authority on diesel and gasoline engines. His knowledge of engines and their application to heavy duty machinery will be a valuable asset to the LeTourneau Co.

Constant demand for more horsepower and greater capacity by users of this type equipment led to the development of bigger and more efficient land clearing and construction tools by LeTourneau. With new lands to be cleared to help feed an ever increasing population, with new roads, airports and dams needed to serve the fast moving tempo of our times—the LeTourneau Co. has led the world in building new and revolutionary giant machines to reshape the earth. The LeTourneau line of huge rubber-tired bulldozers and self-propelled earthmoving scrapers are giant in size and production. As might be expected they utilize engine power in sizes unheard of in the



Hans A. Bohuslav

construction industry. It is in connection with these power applications that Mr. Bohuslav is joining the LeTourneau organization.

Mr. Bohuslav will assume his duties as special assistant to Mr. R. G. LeTourneau on January 1st and will make Longview, Texas his headquarters.

POWER UNIT OF THE MONTH

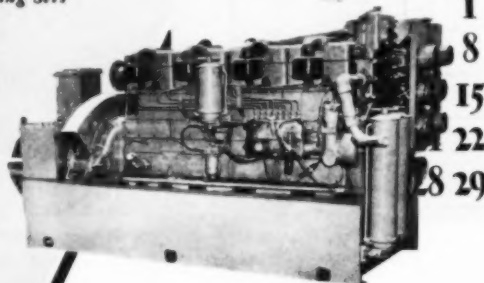
100 KW Superior Diesel Generating Sets

ENGINE

Superior GDB-8
8 cylinder, 5 1/2 x 7 Bore and stroke
150 H.P. @ 1200 r.p.m.
32 volt electric start
Bosch fuel injection
heat exchanger cooled

GENERATOR

100 KW—230 volts DC or:
100 KW 3 phase, 60 cycles,
220/440 volts AC @ 1200 r.p.m.

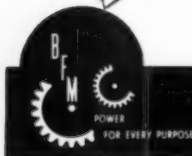


Uncle Sam comes through again via his nephew BFM with more big government surplus savings.

These brand new, 8 cylinder Superior diesels direct-connected to AC or DC generators, contain their own built-in engine panel board and are uniformly mounted on an all steel base. Heat exchanger cooling makes them ideal for marine or stationary installations and the wonderful low price is a blessing. Not only is the price low, but these Superior sets are available for delivery within two weeks from the date of order.

If you're in the market for a dependable, reasonably priced, work horse of 100 KW diesel set, drop us a line today —

And, don't forget, whatever your problem as long as it spells
P-O-W-E-R, call on BFM.

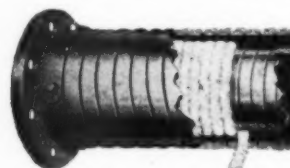


BENJAMIN'S FOR MOTORS

2090 Mill Avenue, Brooklyn, New York

Seamless Flexible Steel Exhaust Hose

THE Atlantic Metal Hose Company has recently published a new bulletin describing its line of Seamless Flexible Steel Hose for high temperature exhaust connections on diesel engines. This bulletin describes the construction and use of the hose as well as offering valuable information on application problems such as the use of flanges, application of insulation, stress relief, and proper method of offsetting flexible connections.



Atlantic double insulated exhaust hose

Atlantic flexible steel hose cannot leak and will not burn out. It has no joints or packing of any kind. Is furnished in straight lengths or bent to specifications. Atlantic also has available double insulated exhaust hose designed to retain exhaust heat which might cause uncomfortable living or working spaces under certain conditions. This type of hose is asbestos insulated between two interlocked hoses. Write for Bulletin 10-C, Atlantic Metal Hose Co., Inc., 123 W. 64th St., New York 23, N. Y.

Order Your Copy of the 1948 DIESEL ENGINE CATALOG, Vol. 13 now. Thoroughly revised — more complete — indispensable. Convenient order coupon on page 66 this issue. Mail it today.

New Shim Stock Wall Rack

A new convenience for the user of shim stock has been brought out by the Laminated Shim Company of Glenbrook, Conn. A sturdy metal wall or bench rack (Rack No. 77) which holds any four gauges of the company's 6" by 100" brass or steel stock rolls is now sold by industrial and automotive distributors. The stock is packaged in thicknesses from .001 to .012" and the purchaser may choose the four gauges for which he has the greatest use. Previously, throughout the trade, only standard assortments were available without this element of choice permitted to the user. For further information write Laminated Shim Co., Glenbrook, Conn.



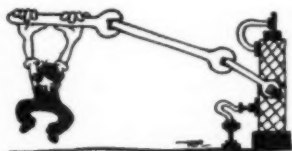
King Rejoins Elliott Company

M. A. KING, formerly manager of engineering, has rejoined the Elliott Company as engineering vice president, Jeannette Division. The announcement of his appointment was recently made by W. A. Elliott, president. Mr. King, who had previously been with Elliott for 27 years, was executive engineer for the turbine division of Worthington Pump & Machinery Corporation for the past five years.



M. A. King

King joined the Kerr Turbine Company of Wells-ville, N. Y., in 1916. Elliott purchased the Kerr Turbine Company in 1923 and made King its chief engineer in 1924. He moved to Jeannette with the turbine department in 1927 and became turbine manager in 1932. In 1941 he was appointed manager of engineering for the company.

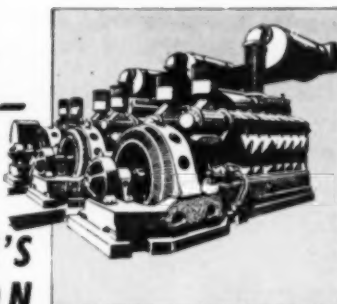


*Throughout the
Power Industry—*

**Aerofin units do the job
Better, Faster, Cheaper**

**...AND HERE'S
THE STORY ON**

AEROFIN



This air-pressure test is one of many tests used to control the quality of Aerofin finned heat-transfer surface. If no bubbles appear in the specially illuminated tank, it means the immersed Aerofin unit has withstood the terrific strains of steam and hydrostatic pressure tests and is ready to give you long, efficient service.

Rigid specifications and inspection, backed by more than 25 years of experience in manufacturing finned heat-transfer surface, assure you of Aerofin dependability, durability and maximum efficiency.



Aerofin is devoted exclusively to the production of finned heat-transfer surface. This specialization enables Aerofin to select just the right surface and materials for the job, and to assemble these materials into a highly efficient unit.



Day after day, thousands of Aerofin Finned Heat-Transfer Units demonstrate their superiority under the most severe conditions. Complete research has developed accurate ratings which allow you to install Aerofin at full rated capacity with confidence.

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NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

Expansion Program Completed By Gulf

A \$19 MILLION expansion program has recently been completed by Gulf Oil Corporation at its Port Arthur, Texas, refinery. New construction includes a desulphurization unit, a polyform unit, three atmospheric-vacuum topping stills, and an extension of docking facilities. The new units will enable the conversion of a greater portion of the incoming crude either to fuel oil—or to gasoline—as required to supply needs at any particular period.

Potentially, Gulf officials stated, the new installa-

tions could increase the refinery's crude charging capacity by 66,000 barrels a day.

Adjustable Range Smoke Density Meter

BACHARACH Industrial Instrument Company has developed a meter which is suitable for smoke density measurements of oil-burning equipment, as well as for sampling dust in the atmosphere and for other applications requiring knowledge of the concentration of particulate matter suspended in gas or air. This instrument makes a permanent record of an actual smoke sample on a paper test disc.



Smoke density meter.

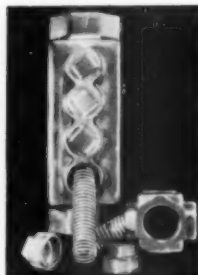
The meter consists of a sampling unit and an electrically driven vacuum pump. Its operation is automatic. It is merely necessary to insert test disc, and flick the time control switch. The meter can be adjusted to practically any desired smoke density range by varying the sampling interval between 30 and 90 seconds.

Further particulars are available from the manufacturer—Bacharach Industrial Instrument Company, 7000 Bennett Street, Pittsburgh 8, Pa.

New Cooling System De-Scalers

A NEW SERIES of De-Scaler units, designed for the prevention and removal of rust, corrosion and scale in the cooling systems of diesel and large gasoline power engines, has been announced by the Butler Engineering Co. The new EZ series includes Butler De-Scalers for cooling systems having a water capacity of from 50 to 600 gallons. Larger capacity cooling systems can employ De-Scalers in multiple units. The series has been

announced after more than two years of successful tests on railroad, marine and stationary engines. Acting on the principle of a galvanic cell, Butler De-Scalers keep the cooling water free of scale-forming mineral content, remove existing rust and scale from the piping, radiator, heat exchangers and motor block and



Butler EZ De-Scalers

precipitate the mineral salts, rust and scale to the bottom of the cooling system for easy drainage. The De-Scaler action employs no chemicals and replaces all chemical compounds for cooling system clean-outs. It can be used with antifreeze. For further information, write the Butler Engineering Co., 2612 Rousseau St., New Orleans, Louisiana.

Dravo Opens Branch Office

THE Machinery Division of Dravo Corporation, Pittsburgh, has opened a branch office in Baltimore, Md. C. P. Cryer, formerly of the firm's Philadelphia Office, has been placed in charge of the new office at 100 N. Eutaw St. The Baltimore office represents De Laval Steam Turbine Co., Askania Regulator Co., and Davis Engineering Co.

INCREASED LOAD DEMANDS A TOUGHER DIESEL OIL!



D-X DIESEL MOTOR OIL

This superior lubricant has unusually high resistance to heat, oxidation, sludge formation and corrosion. It has a higher viscosity index. *It stands up!*

That's why more and more operators of heavy duty Diesels are specifying D-X Diesel Motor Oil. They depend on D-X to keep their Diesels running with a minimum of shut-down time. Mail the coupon below today for complete information about D-X Diesel Motor Oil.

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TULSA, OKLA.

Waterloo, Iowa Terre Haute, Ind. Chicago, Ill.
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MID-CONTINENT PETROLEUM CORPORATION
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Gentlemen: Send me at once the story of D-X Diesel Motor Oil, the oil that stands up.

Name _____

Address _____

City _____ State _____

Firm Name _____

NEW ENTERPRISE DIESELS

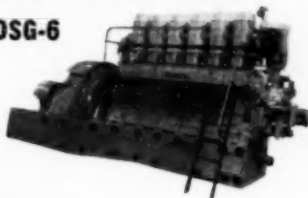
MODEL DSG-6

*2—300 KW AC

*2—250 KW DC

450 HP at 450 RPM

*New



| HP | Model | KVA | RPM |
|--------|-------------------------|-------|--------------------|
| 2—1600 | General Motors 16-278A | 1250 | 720 3/60/2300 |
| 2—1600 | General Motors 16-278A | 1250 | 720 3/60/2400-4160 |
| 1—450 | Fairbanks Morse 32-E-14 | 375 | 300 3/60/240 |
| 1—300 | Fairbanks Morse 32-E-14 | 250 | 300 3/60/240 |
| 1—360 | Fairbanks Morse YVA | 300 | 257 3/60/2400 |
| 1—300 | Buckeye E | 250 | 400 3/60/240-480 |
| 1—240 | Fairbanks Morse YVA | 200 | 257 3/60/2400 |
| *2—240 | Buckeye 80 | 187.5 | 600 3/60/240-480 |
| 1—225 | Buckeye E | 187.5 | 400 3/60/240 |
| 1—180 | Fairbanks Morse YVA | 150 | 257 3/60/2400 |
| *3—150 | Worthington 8B-5 | 125 | 600 3/60/460 |
| *3—90 | General Motors 6016-E | 75 | 1200 3/60/127-220 |
| *2—45 | International UD-14 | 37.5 | 1200 3/60/127-220 |

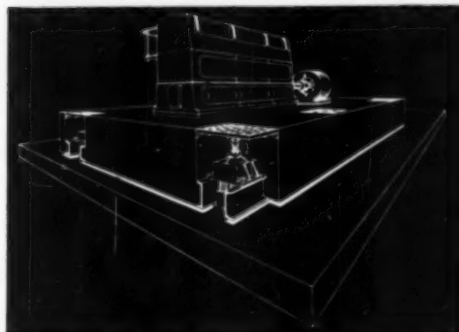
Diesel Motors

Port Washington, LI, NY CORPORATION Port Washington 7-2000

DON'T GUESS

at

DIESEL VIBRATION CONTROL



Korfund Steel Spring Units give pre-determined isolation and can be adjusted after installation to conform with exact engine operating conditions.

Korfund Engineering provides highly efficient and economical Vibration Control—whether for a large engine with concrete foundation or a small engine mounted directly on the Isolators.

There's a Korfund solution for all your Diesel mounting problems. Write today for free bulletin describing Korfund Diesel Engine Isolation.



THE KORFUND COMPANY, INC.

48-28 Thirty Second Place • Long Island City 1, N. Y.
"Specialists in Vibration Control for Over 45 Years"

Atlantic Metal Hose For All Diesel Services!

RECOMMENDED for high quality performance by Engine Builders, Marine Architects, Industrial Designers and Engineers. Atlantic Flexible Metal Hose is supplied in various metals, diameters and lengths, including fittings. Sizes 3/16" to 36" ID are available. Ideal for Diesel Exhausts, Air Intakes, Fuel, Lube, Water and Air Lines!



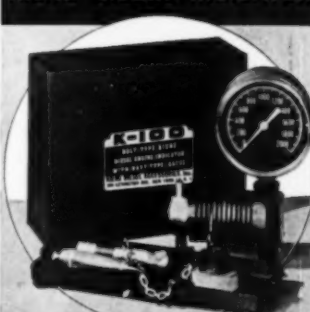
Left, asbestos insulated, air-jacketed exhaust heat retaining hose. Below, Type SW, Diesel Exhaust. Absorbs vibration, expansion and contraction.



Ask for our Diesel Bulletin 1020

Atlantic Metal Hose Co., Inc.
102 W. 64th St., New York, N. Y.

KIENE DIESEL INDICATOR



- No Pistons - No Springs - Only One Moving Part.
- Simple and Rugged Construction.
- Easy to Use - No Experience Necessary.
- Compact - Light in Weight - Low in Cost.

for
**QUICK AND ACCURATE TESTING OF
COMPRESSION AND FIRING PRESSURES**

For Maximum Efficiency of Diesel Engines

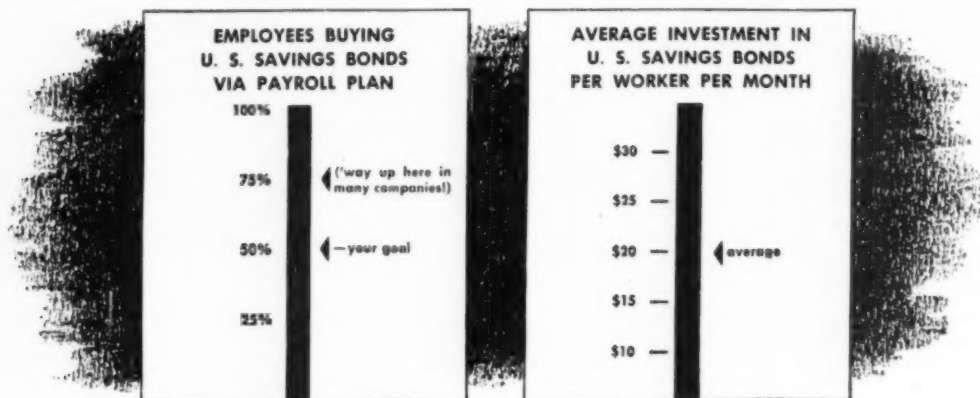
It is essential to check, regularly, compression and combustion pressures. Leaking valves, bad piston rings, improper combustion, faulty cylinder lubrication, unequal load distribution between cylinders and many other irregularities may be detected by accurate pressure readings while the engine runs.

Write for descriptive bulletin

KIENE DIESEL ACCESSORIES, INC.

10352 PACIFIC AVE., FRANKLIN PARK, ILLINOIS

How is YOUR company doing in this "EVERYBODY-BENEFITS" plan?



Compare your employee participation with others who have Payroll Savings

If the figures for your company fall below those shown above, you're missing your share of benefits of the Payroll Savings Plan! These benefits are described below. Nation-wide experience proves that when top management puts the "OK" on the Plan, its benefits rise sharply.

BENEFITS TO EMPLOYEES: Every \$3 invested in Savings Bonds pay \$4 at maturity. Workers gain a 33½% return on their money—enabling them in the future to buy more of the things they will want—plus the peace of mind that goes with regular saving.

BENEFITS TO EMPLOYERS: The feeling of security that goes with participation in Payroll Savings makes workers more contented. Worrying less, they work better. Among the more than 20,000 large companies with Payroll Savings, records show that—following installation of the Plan—production increased, absenteeism and accidents decreased!

BENEFITS TO THE NATION: The Payroll Savings Plan is a powerful deterrent to inflationary forces. Every Savings Bond dollar built up in the Treasury withdraws a dollar

from the swollen spending stream. The Plan thus contributes to national security—which affects *your* security!

WHAT CAN YOU DO? If your company has the Payroll Savings Plan, make sure it's being adequately promoted—backed by your top executives—to bring your company its full measure of benefits. If you haven't yet installed the Plan, why pass up its benefits any longer? All the help you need is available from your State Director, Savings Bonds Division, U. S. Treasury Department. He is listed in your telephone book. Call him now!

Do You Realize...?

- Over \$75,000,000,000 worth of Savings Bonds have been bought since 1941.
- More than ¾ of this volume—over \$50,000,000,000—is still held by the purchasers.
- During 3 months of 1948, 1,500 additional large firms installed the Payroll Savings Plan.
- Via this plan, 7,500,000 workers are each investing on the average of \$20 per month of their pay—more than \$150,000,000 per month—in Bonds.

The Treasury Department acknowledges with appreciation the publication of this message by


R. M. Tadmor

Editor—DIESEL PROGRESS



This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

*Nothing could shake
Mother Earth
if she were supported by -*



HUSSMAN SHOCK ABSORBER MOUNTINGS

CARL HUSSMAN INC. CHICAGO
VIBRATION AND NOISE ISOLATION

Just Out
**Supercharging
The Internal
Combustion Engine**

By E. T. Vincent
Professor of Mechanical Engineering
University of Michigan

323 pages, 6 x 9, 167 illustrations, \$5.00

This book contains the essential fundamental theory of the various forms of superchargers and turbo-superchargers, together with a treatment of their effects on engine cycles, power outputs, and thermal efficiencies. The emphasis is on the fundamentals of the thermodynamics and mathematics involved in solving problems of supercharging.

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McGraw-Hill Book Co., Inc., 330 W. 42nd St., N. Y. 18
Please send me a copy of Vincent—SUPERCHARGING
THE INTERNAL COMBUSTION ENGINE for 10 days'
examination on approval. In 10 days, I will remit \$5.00,
plus few cents postage, or return book postpaid.

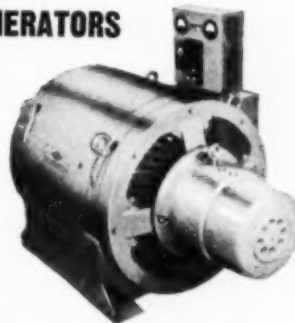
Name
Address
City and State
Company
Position DP-1-49

A. C. GENERATORS

350 watts to
300 K.W.
720-900-1200
and 1800 R.P.M.
25, 50 and
60 cycles.

The illustration
shows 150 K.W. 1200
R.P.M.

Lower speeds are
with tap mounted
bellevue motor.



ROTARY CONVERTERS

80 watts to 2500 watts

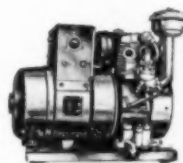
LIGHT PLANTS

500 watts to 15 K.W.

For 20 years Katolight Converters
have been in use in all parts of the
world.

Motor Generator Sets and
High Frequency Generators.

Special motors are a specialty with
us. Single phase and three phase,
25 cycle to 400 cycle, also A.C.
Motors.



KATO ENGINEERING CO.

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Mankato, Minn.

DIESEL GENERATOR SETS

FOR
IMMEDIATE
DELIVERY



UNIT CAPACITIES

10 TO 1420 KVA

A.C. 50 AND 60 CYCLES
ANY VOLTAGE

Write or wire today for bulletins and complete
information regarding these fine fully guaranteed
DIESEL ENGINE GENERATING UNITS.



SCHOONMAKER CO. INC.

54 CHURCH STREET NEW YORK 7, NEW YORK

**NOW
AVAILABLE**

**NEWLY REVISED
BROUGHT UP TO
THE MINUTE**



**THE ENTIRE DIESEL
INDUSTRY UNDER ONE COVER**

Whatever you are looking for in diesel engines, or accessories, you will find them described and illustrated in the 1948 **DIESEL ENGINE CATALOG**, Volume 13, edited by Rex W. Wadman. What's more, you will find complete specifications on

840 DIFFERENT MODELS

The Products of 53 Engine Manufacturers. Each engine description is complete and accurate—checked and double-checked by the Manufacturer himself. Illustrations include full page engine views, lube and fuel system diagrams, also cooling systems—many traced in color. But that is just the Diesel engine section. The Catalog also includes an accessory section carrying valuable information on the various Fuel Injection Systems, Gear and Chain Drives, Turbochargers, Blowers, all fully described and profusely illustrated.

FOR DESIGN AND OPERATING ENGINEERS AND BUYERS

There is a Market Place Section—a directory of Diesel engines classified as to ratings and speeds with manufacturers' names and addresses—and a Product Directory including accessories, parts, materials and services—all classified as to products. The Market Place tells you at a glance where to find what you want for your engine or plant.

13th edition of the **DIESEL ENGINE CATALOG**

NO OTHER DIESEL BOOK LIKE IT Really 4 Books In One

1. The main section is devoted to descriptions, illustrations and specifications of all the Diesel engines manufactured in this Country.
2. A large section carries complete illustrated descriptions of Diesel engine and plant accessories.
3. The Market Place—a classified directory of Diesel Engines and Accessories.
4. Manufacturers' Advertisements—informative—helpful.

REVISED ANNUALLY

The most widely-used Diesel reference book published:—Because the book is revised and brought up to the minute each year, thousands of design and operating engineers, purchasing and sales executives, Diesel students buy the **DIESEL ENGINE CATALOG** each year and constantly refer to it throughout the year. The 1948 Edition, Volume 13, embodies sweeping changes—new models and types, revised designs, and carries the basic information published in previous editions. Whatever your interest in Diesels is you will find this Edition of the **DIESEL ENGINE CATALOG** indispensable.

DIESEL ENGINE CATALOG

Two West Forty-Fifth Street, New York 19, N. Y.

Enter my order today for a copy of the 1948 Diesel Engine Catalog, Volume Thirteen, Edited by Rex W. Wadman, for which I enclose \$10.00, also payable at £2 10s. 0d. to E. H. Doddrell, 342 St. Paul's Corner, Ludgate Hill, London E.C.4.

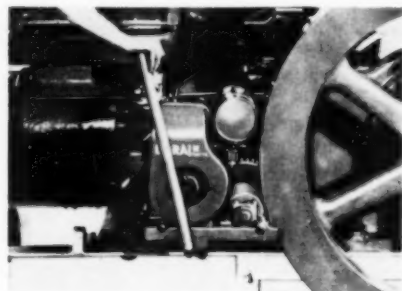
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COMPANY TITLE
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Your copy will be shipped promptly upon receipt of your order.

New Starter for Fly-Wheel Engines

A NEW, self-powered, friction-drive starter for diesel or gas engines is announced by the White-Roth Machine Corporation. Known as the Lorain Friction Starter, the first models are in quantity production and available for short-time deliveries. While produced primarily for use on Lorain diesel or gas engines, the manufacturer states that the starter can be used equally well on any horizontal or vertical type engine having an exposed fly-wheel.



Lorain Starter mounted on White-Roth engine.

The Lorain Starter, for which patents are pending, is powered by an air-cooled, single-cylinder gasoline engine with 4 brake horsepower output. The gasoline engine drives a plastic composition friction pulley through a chain and sprocket reduction gearing system. The Lorain Starter is installed on the diesel or gas engine so that the friction pulley contacts the flywheel rim when the operator manipulates the throw-in throw-out lever. This brings the diesel or gas engine up to speed and the starter is disengaged. The unit is shipped complete, ready for immediate installation. Shipping weight is 230 pounds. Over-all dimensions are: length 18 in.; height 24 in.; width 21 in. For further information write White-Roth Machine Corp., Lorain, Ohio.

Vibration Control Data Given In New Korfund Bulletin

THE advantages and limitations of spring mountings, rubber mountings, and cork materials in the control of vibration, together with data on their installation and uses are given in a new bulletin just released by the Korfund Co., Inc.

A Selector Chart tabulates more than 50 typical machine and equipment applications and gives recommendations for the proper types of vibro isolators for highest efficiency, and for satisfactory operation under less critical conditions—both with and without concrete foundations. Write Korfund Co., Inc., 48-20-J, 32nd Place, Long Island City, N. Y. for Bulletin G-101.

Titelflex Names Pittsburgh Distributor

TITFLEX, INC., recently announced the appointment of Manufacturers Sales Agency, 523 Brushton Avenue, Pittsburgh 21, Pa., as exclusive sales agents for Titelflex products in Western Pennsylvania and West Virginia. Mr. Lewis Detch is manager of Manufacturers Sales Agency. Associated with him are N. Chirumbole, Herbert Jones, and Roy Evissel.

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ON THE TUNA CLIPPER
Coronado

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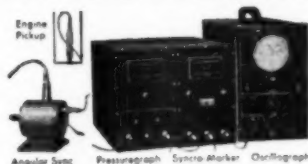
STARTING air supply for the Coronado's three Buda Auxiliary Diesels is furnished by three Model 340 Quincy Compressors. The answer to an efficient and economical air supply lies largely in getting the correct size and type compressor for the job. That's why you can depend on Quincy Compressors for your air requirements. Quincy builds the most complete line ranging from 1 to 90 c.f.m. Units can be operated either by electric motor or gasoline engine. Each model incorporates modern improved design features — both inside and out — that assure greater over-all efficiency. For details, write QUINCY COMPRESSOR CO., Dept. K-19, Quincy, Illinois.



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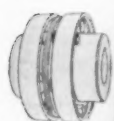
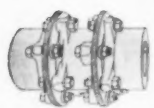
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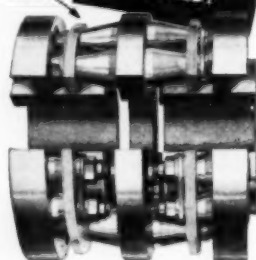


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Write for New Engineering Catalog

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Fairbanks-Morse Stages Diesel Sales Conference

WITH "It's Time To Sell Diesels Again" as their theme, over 200 Fairbanks-Morse & Co., men from branch houses, field sales and service divisions spent four days recently in a "work conference," at their Beloit, Wisconsin, works. The members in attendance at the conference came from all parts of the United States, Mexico and Canada. General chairman of the "work conference" was Mr. O. O. Lewis, Sales Manager, assisted by T. M. Robie, Manager of Diesel Sales, and H. J. Barbour, Manager of Sales Promotion and Public Relations.

The first session included an intensive and scientific analysis of the subject, "How To Hire and Improve People."

O. O. Lewis, Sales Manager, started the regular sessions with a welcome to 185 field engineers, branch house and diesel department managers. Also there to greet the group were R. H. Morse, Jr., C. H. Morse III, L. A. Keeler, Vice Presidents; and Henry Haase, General Manager of Fairbanks-Morse & Co., Beloit Works.

The next day engineers presented papers covering the application of the Opposed-Piston and Model 31 en-bloc diesels. Also shown were new, improved models of engines. Discussion of these new products, not yet presented to the public, centered around their benefits of lower cost operation and increased service in marine and stationary use.

Closing day of the "work conference" was devoted to a comprehensive discussion of engineering studies and developments of Dual Fuel use. Addressing the group on engineering subjects were: H. N. Edens, Plant Engineer of the Freeport Works; G. R. Anderson, Director of Engineering; L. D. Thompson, Supt. of the Experimental Department; and Geo. Schauers and R. H. Beadle, Research Engineers.

Sales suggestion talks were presented by W. W. Guernsey, Manager of the Kansas City Office; T. W. Drennen, Manager of the New York Office; Geo. Wrocklage, Manager of Sales Promotion, Chicago Branch; and H. J. Barbour, Manager of Sales Promotion and Public Relations.

L. A. Harlow, Advertising Manager, and L. L. Jacobs, Account Executive of The Buchen Company, revealed the company's advertising plans.

Pipeline Booster Unit

THE Phillips Petroleum Company, in collaboration with the Diesel Power Company found the answer for pipeline pressure drop in a portable pumping unit, powered by a General Motors Twin-6 diesel engine. This General Motors diesel power plant delivers 260 continuous hp. at 900 rpm. shaft speed and is mounted on a skid type structural steel base with a 4 stage centrifugal



Portable pumping station

pump. Drive from engine to pump is through a speed increaser at 3600 rpm. The pump output measures 32,000 bpd. of petroleum products at 365 psi. differential pressure. The long shaft shown in the photograph was installed to allow construction of a fireproof wall between the engine and the gear. This protects the engine room from damage, should inflammable material leak from the packing glands of the pump. Units designed for crude oil lines do not have this shaft.

Engineering Societies Meetings Scheduled S.A.E. National Meetings

| 1949 | | | |
|--|---------------------------|-------------------|--------------|
| Annual Meeting and Engineering Display | Book-Cadillac Hotel | Detroit, Mich. | Jan. 10-14 |
| Passenger Car, Body and Production Meeting | Book-Cadillac Hotel | Detroit, Mich. | March 8-10 |
| Transportation Meeting | Statler Hotel | Cleveland, O. | March 28-30 |
| Aeronautic and Air Transport Meeting | Hotel New Yorker | New York, N. Y. | April 11-13 |
| Summer Meeting | French Lick Springs Hotel | French Lick, Ind. | June 5-10 |
| West Coast Meeting | Mulmoham Hotel | Portland, Ore. | August 17-19 |
| Tractor (possibly diesel) | | Milwaukee, Wisc. | September |

A.S.M.E. National Meetings

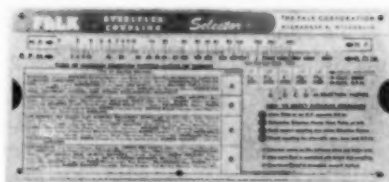
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|----------------------------|--------------------|---------------------|----------------|
| Oil and Gas Power Division | Hotel Sherman | Chicago, Ill. | April 25-29 |
| Spring Meeting | | New London, Conn. | May 24 |
| Semi-Annual | | San Francisco, Cal. | June 27-30 |
| Fall Meeting | | Erie, Pa. | Sept. 28-30 |
| Annual Meeting | Hotel Pennsylvania | New York, N. Y. | Nov. 27-Dec. 2 |

Allis Chalmers Switchgear Guide

ALLIS-CHALMERS broad line of switchgear and control devices is covered in a new 16-page guide recently released by the company. Described and illustrated are rotary control switches, push button stations, generator voltage regulators, synchro-operators, current and potential transformers, oil and air circuit breakers, disconnect switches, oil immersed contactors, d-c relays and contactors, thermal relays, d-c remote positioning devices, indicating lamps, resistors, and terminal boards. Types and ratings are supplied on the various equipment while standard wiring diagrams and photos of typical station combinations accompany the data on push button stations.

Copies of "Allis-Chalmers Switchgear and Control Devices," 25B7095, are available upon request from Allis-Chalmers Manufacturing Co., S. 70th St., Milwaukee, Wis.

Coupling Selector Offered



A NEW Steelflex Coupling Selector was recently released by The Falk Corp. This new Coupling Selector will take care of the selection of couplings from Falk sizes 3F up to size 18F. This handy new slide rule selection method makes it easy for a prospect to determine exactly which coupling size is correct for his application.

A Steelflex Coupling Selector will be furnished to all inquirers who can find suitable use for

this selection aid upon writing to The Falk Corp., 3010 West Canal St., Milwaukee 8, Wis.

Large Prison Converts From Steam to Diesel

THE Missouri State Penitentiary, Jefferson City, second largest prison in the United States, swings over from steam to diesel-electric power, as it dedicates its new \$500,000 plant in December. Superior diesels driving Electric Machinery generators, rated 3000 kw. are being installed. Extensive studies by Roscoe C. Collier, Chief Engineer of the Missouri State Department of Corrections and his research staff, estimate annual savings of \$95,000 over present 1938 model steam turbine-generators.

While several diesel units are used as stand-bys in other state penitentiaries in the United States, this is the largest single prison installation.

FREE MANUAL SHOWS

7 Ways to Speed up Diesel Cleaning

1. De-scaling Diesel cooling systems
2. Cleaning lube oil and jacket water coolers
3. Degreasing parts before repair and overhaul
4. Reconditioning Diesel air-intake filters
5. Cleaning intercooler of air compressors
6. Keeping painted equipment clean, shining
7. Cleaning waste heat boilers or water heaters

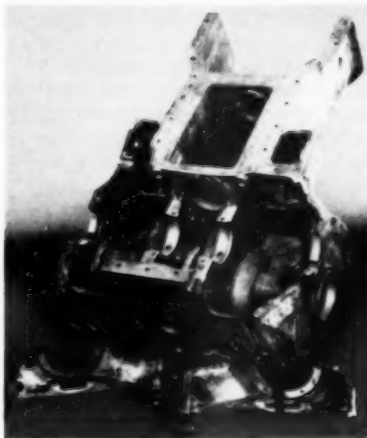
FREE Manual describes these and 64 other maintenance-cleaning jobs. Contains many effort-saving tips for removing scale, rust, sludge, oil, grease and similar deposits. They're all in the "Oakite 71 Digest." Send for your FREE copy, today.

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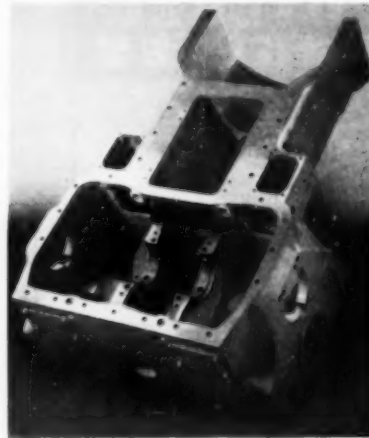
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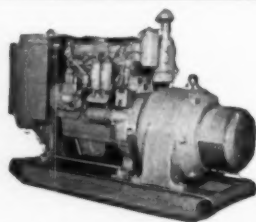
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West Coast Diesel News

By FRED M. BURT

RECENTLY completed at Martinoli Shipbuilding yards in San Diego, for Skipper Manuel Bettencourt and associates, 98-ft. tuna clipper *American Belle*, is powered with a 460-hp. Superior diesel; auxiliaries are two 6-71 General Motors diesels connected to 60-kw. generators.

POWERED with a 130-hp. Buda diesel, a 38 ft. northern type salmon troller, purchased in Seattle by Ernest K. Gann, has been brought south to fish out of San Francisco.

A NEW, 31 ft. combination fishing vessel *Angie Frances*, built by Genoa Boat Works, Fishermen's Wharf, San Francisco, for Dominic Tringali and Vince Intreviglia, is powered with a 55-hp. General Motors diesel.

THE Navajo Truck Lines, operating from Texas to California, and greatly extending their operations to the north, mid-west and east, have 18 new Autocar trucks with Cummins diesel engines, as recent additions to their huge fleet.

LAUNCHED by the Puget Sound Boat Building Co., Tacoma, a 121 ft. wooden tuna clipper, sister-ship of the *Sun Traveller*, is powered with a 600-hp. Washington diesel, with three GM auxiliary diesels. Owner is the French Sardine Co.

A NEW Lorain two yard shovel for Le Roix Machinery Company of Los Angeles is being powered with a Waukesha 6-cyl. 201-hp. @ 1300 rpm., diesel engine.

THE *Fan Tuna*, Van Camp Sea Food Company's research and scouting vessel is being equipped with two new 200-hp. General Motors diesel engines with Adel single level clutch and throttle control; also a 30-kw. GM diesel-generating set was installed by Crofton Diesel Engine Co.

WITH a 180 hp. Atlas for propulsion, and a 26 hp. Caterpillar diesel as an auxiliary, the 66-ft. *Sunward*, was purchased by Capt. Earl McCarty at Hoquiam, Wash. where she was built by Ivar Chilman; to succeed the *St. Patrick*, used by McCarty in dragging from Hecate Strait to Bodega Bay.

TO BE skippered by Nick Capalia, the *Charlotte*, 65 ft. tuna clipper was converted to a purse seiner at the Long Beach Marine Repair Yard; main diesel is a 150-hp. 6-cyl. Murphy; two Caterpillars for auxiliaries.

FROM Steelbuilt Cruisers, Oakland for Ray Devore and Charlie Bradshaw, powered with a 225-hp. General Motors diesel, *Marcie Ann*, smart new steel, 38 ft. fishing boat, that will carry 10 tons of fish at 12 mph.

FOR operations of Cook Lumber Co. in Oregon, a 131,000 lb. truck crane, built by Thew Shovel Co., Lorain, O. (the three such units built are probably world's largest truck cranes) is powered

Send for bulletin
9P1



114 Liberty St., N. Y. 6

FOR THE BEST IN DIESEL REPAIR USE METALOCK

METALOCK can repair cracked or damaged diesel engine parts. Metalocking is a cold worked repair method which leaves no dangerous heat stresses within the parent metal. All repairs are guaranteed in accordance with the 10-year record of success of the company.

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EXECUTIVE WANTED

Established manufacturer of large Diesel engines, for municipal and industrial field, has opening for General Manager. He should be a mature man, well-trained and experienced in the manufacture, design, operation and sales of large, industrial, Diesel engines. Advise full particulars in first letter with regard to experience, salary, and so forth. All replies held in strictest confidence. Address: Box 493, DIESEL PROGRESS, 2 W. 45th St., New York 19.

DEALER WANTED

Manufacturer of medium- and heavy-duty diesel engines for stationary and marine service will appoint a dealer for New York and New England territory. Only those experienced in diesel engine sales and having machine shop facilities for installation and servicing diesel engines will be considered. If you have these qualifications and wish to negotiate further, write Box 490, DIESEL PROGRESS, 2 West 45th St., New York 19, N. Y.

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Governors
Is Available When You
**SPECIFY
PICKERING
FOR YOUR ENGINES**

PORTLAND



CONN.

with two Waukesha WAKD diesels, 201-hp.; one in the chassis, other for the crane.

UNDER construction for Oscar Haynes and Son at Olaf Hansen boat shop in Wrangell, Alaska is a 50 ft. combination salmon and tuna fishing boat, to be powered with a 100-hp. Buda diesel with a Lanova head, swinging a Coolidge wheel.

A DIVISION of Northern Commercial Co., N. C. Marine, has been appointed Caterpillar marine diesel distributor for Western Washington. Appointed by Volney Richmond, president of the parent company, L. O. (Larry) Johnson will manage the new operation, with headquarters in Seattle.

FIVE 37 ft. x 12 ft. "pocket seiners" to be powered with 65-hp. Kernath diesel engines, as the first of possibly 50 such boats to be used in government development of Uruguayan commercial fisheries, have been ordered from Bryant's Marine, Seattle. Designed by Edward Monk, they follow the plans of 25 such boats built at Bryant's for specialized Alaskan fishing operations.

FOR Bragg Crane Service, South Gate, Calif., a 20-ton Bay City truck crane has been powered with a Cummins 150-hp. diesel engine.

FOR irrigation purposes, Lee Ellsworth, Queen Creek, Arizona, has installed two Superior, G-510, 6-cyl. 300-hp. natural gas engines, driving deep well turbine pumps through right angle gears.

THE latest addition to Libby, McNeill & Libby's Bristol Bay fleet is the new 80 ft. x 24 ft. wooden power scow, *Marmot*, built by Seattle Shipbuilding & Drydocking Co., powered with two 115-hp. Caterpillar diesels with 2:1 Twin Disc reverse and reduction gears.

A NEW 52 ft. purse seiner under construction by Wrang Shipyard Co., Bellingham, Wash., for John Baker, Point Roberts, Wash., fisherman, designed by Walter C. Howell, is powered with a 165-hp. Graymarine diesel with Western hydraulic, 4:1 reduction gear, embodies many special new features.

THE largest commercial ocean tow ever performed in the United States, was all-diesel powered. Purchased by a major oil company in San Francisco, fourteen 327 ft. x 50 ft., 3200-ton L.S.T.'s, were towed to Orange, Texas. "Red Stack" tugs owned by Seattle, San Francisco, and San Pedro companies—the *Hercules*, *Neptune*, *Relief*, *Sea Prince*, and *Sea Wolf* are the tugs that made the trip—four are powered with 1200-hp. turbo-charged Superior and Enterprise diesels, and one with a 1900-hp. Fairbanks-Morse. The tows traveled a distance of 66,822 nautical miles without a mishap.

AT SAN DIEGO'S new Gibbs Municipal Airport, R. E. Hazard Contracting Co. is building two 3400 ft. x 180 ft. runways, using diesel equipment including six Super "C" Tournapulls, and three Model 12 Caterpillars and one AD-4 Allis-Chalmers on graders and sheepfoot rollers.

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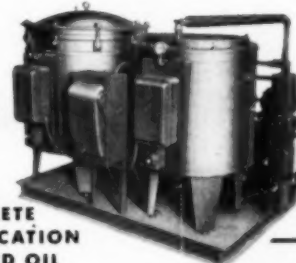
Write for the *Lanova Handbook*

It gives details on the principle and operation of combustion chambers.

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• U.E.I. graduates are energetic, ambitious Diesel-thinking men.

Our thorough practical training in operating, maintaining and repairing of Diesel equipment gives these graduates sound fundamentals . . . couple this to their faith in Diesel's future, and you have the kind of men you want to grow with you.

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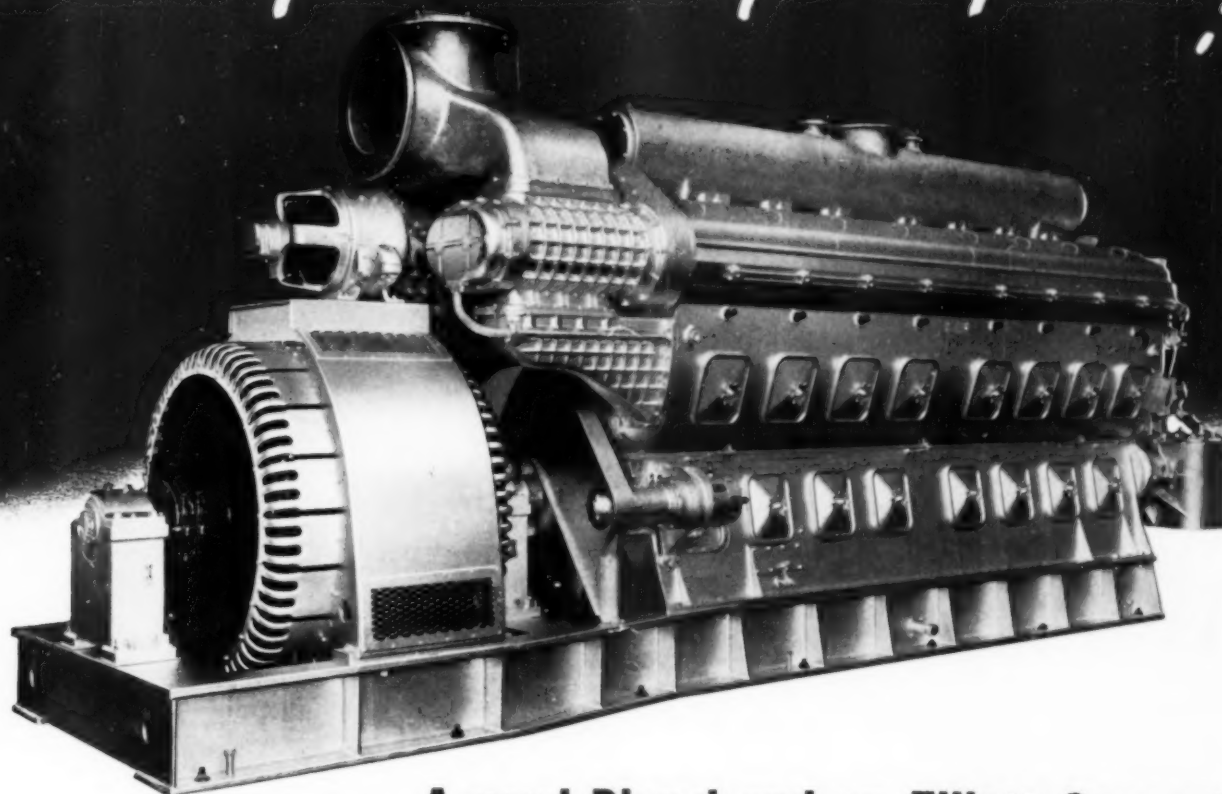
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in 1927



ADVERTISERS' INDEX

| | | | |
|---|--------------|---|--------------|
| Aerofin Corp. | 61 | Kato Engineering Co. | 65 |
| Atlantic Metal Hose Co., Inc. | 63 | Kiene Diesel Accessories, Inc. | 63 |
| | | Koppers Co., Inc. | 10 |
| Benjamin's for Motors | 60 | Korfund Co., Inc., The | 63 |
| Bolinders Co., Inc. | 70 | | |
| Boston Metals Co., The | 57 | Lanova Corp. | 71 |
| Buckeye Machine Co. | 70 | | |
| Burmeister & Wain | 18 | Madison-Kipp Corp. | |
| | | Metallack Repair Service, Inc. | 70 |
| Chicago Pneumatic Tool Co. | 53 | Mid-Continent Petroleum Corp. | 62 |
| Cities Service Oil Co. | 49 | Murray & Tregurtha, Inc. | 1 |
| Cleveland Diesel Engine Division, General Motors Corp. | 2 | National Forge & Ordnance Co. | 71 |
| Columbia Electric Mfg. Co. | 71 | Nordberg Mfg. Co. | 51 |
| Cooper-Bessemer Corp. | Fourth Cover | Nugent & Co., Inc., Wm. W. | 3 |
| | | Oakite Products, Inc. | 69 |
| Detroit Diesel Engine Division, General Motors Corp. | 45 | Petrometer Corp. | 70 |
| Diesel Motors Corp. | 63 | Pickering Governor Co. | 71 |
| Durabla Manufacturing Co. | 70 | Quincy Compressor Co. | 67 |
| | | Rockford Clutch Division, Borg-Warner, ... | 54 |
| Eaton Manufacturing Co. | 14 | Schoonmaker Co., A. G. | 65 |
| Electric Equipment Co. | 71 | Scintilla Magneto Division, Bendix Aviation Corp. | 11 |
| Electric Machinery Mfg. Co. | 55 | Standard Oil Co. (Indiana) | 7 |
| Electro-Motive Division, General Motors Corp. | 17 | Stewart & Stevenson Services | 59 |
| Electro Products Laboratories | 67 | Sticht Co., Herman H. | 71 |
| Elliott Company | Third Cover | Sun Shipbuilding & Dry Dock Co. | 8 |
| Enterprise Engine & Foundry Co. | 47 | Texas Co., The | Second Cover |
| Eric Forge Co. | 16 | Thomas Flexible Coupling Co. | 68 |
| | | Union Diesel Engine Co. | 57 |
| Federal-Mogul Corp. | 58 | U. S. Hoffman Machinery Corp. | 71 |
| Fitzgerald Manufacturing Co., The | 72 | Utilities Engineering Institute | 72 |
| Fulton Iron Works | 56 | Vellumoid Co., The | 69 |
| | | Walworth Co. | 12 |
| Gardner-Denver Co. | 6 | Winslow Engineering Co. | 52 |
| General Motors Corp., Cleveland Diesel Engine Division, | 2 | Worthington Pump & Machinery Corp., ... | 5 |
| Detroit Diesel Engine Division | 45 | | |
| Electro-Motive Division | 17 | | |
| Harrison Radiator Division | 9 | | |
| Graham Mfg. Co., Inc. | 57 | | |
| Guth Company | 69 | | |
| | | | |
| Harrison Radiator Division, General Motors Corp. | 9 | | |
| Hemphill Diesel Schools | 70 | | |
| Hilliard Corporation, The | 50 | | |
| Hussman, Inc., Carl | 65 | | |
| | | | |
| International Harvester Co. | 15 | Young Radiator Co. | 13 |

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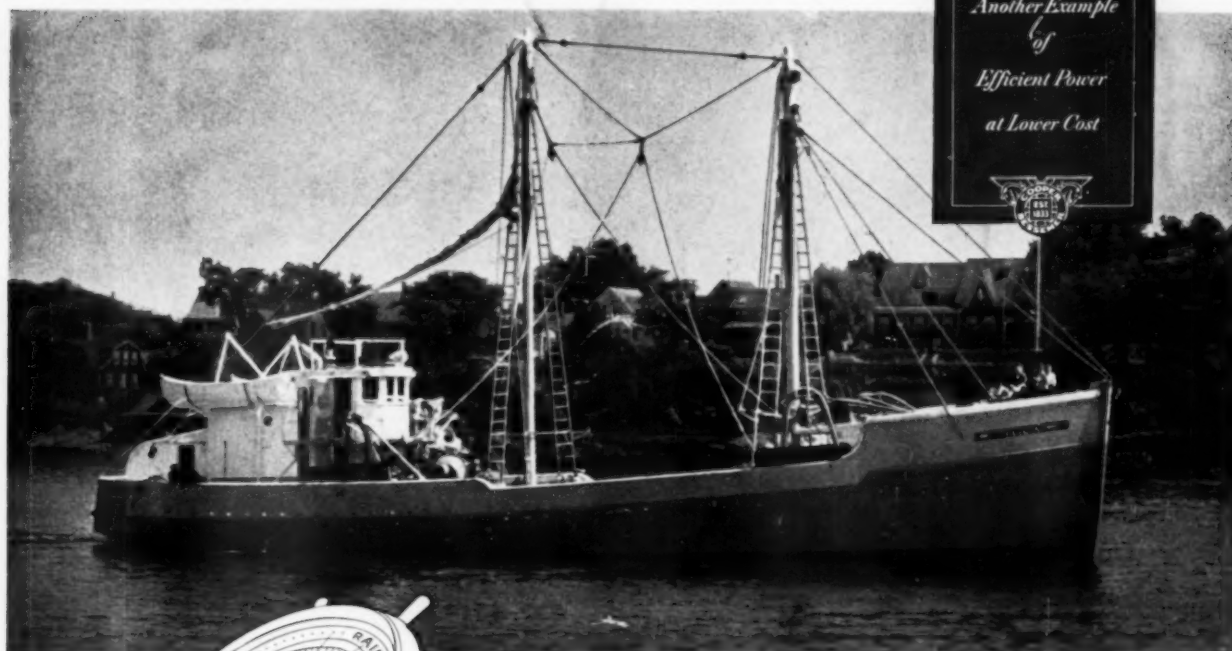
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